

THE RAILWAY GAZETTE

A Journal of Management, Engineering and Operation
INCORPORATING

Railway Engineer • TRANSPORT • The Railway News

The Railway Times • Herapath's Railway Journal • RAILWAY RECORD.

RAILWAYS ILLUSTRATED • ESTABLISHED 1835 • RAILWAY OFFICIAL GAZETTE

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1.

Telephone : WHItchall 9233 (12 lines). Telegrams : "Trazette Parl, London"
BRANCH OFFICES

GLASGOW: 87, Union Street Central 4646
NEWCASTLE-ON-TYNE: 21, Mosley Street Newcastle-on-Tyne 22239
MANCHESTER: Century House, St. Peter's Square Central 3101
BIRMINGHAM: 90, Hagley Road, Edgbaston Edgbaston 2466
LEEDS: 70, Albion Street Leeds 27174
BRISTOL: 8, Upper Berkeley Place, Clifton Bristol 21930

Annually £4 10s. by post.

Single copies, Two shillings.

Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

Editor : B. W. C. Cooke, Assoc. Inst. T.

Vol. 100]

FRIDAY, APRIL 16, 1954

[No. 16

CONTENTS

	PAGE
Editorial Notes	425
Canadian National Railways	427
Translating Railway Terms	428
British Transport Commission Traffic Receipts	428
The New Woodhead Tunnel	429
The Era of Diesel Motive Power	429
Letters to the Editor	430
The Scrap Heap	431
Overseas Railway Affairs	432
Review of Electric Traction Systems	434
Electric Traction Section	436
Oil-Burning Locomotives for Iraq	442
Personal	443
News Articles	446
Contracts and Tenders	449
Notes and News	449
Railway Stock Market	452

Cross Purposes

THE outlook over the Easter holiday and for the immediate future as regards railway wages seems to be a continuation of the present uneasy and unsatisfactory compromise. The British Transport Commission, after awaiting the proposals of the three railway unions last week, laid before them its suggestions for a revised wages structure for salaried and conciliation staff, for discussion by the Commission and the unions of the railway wages structure in accordance with the wages agreement of last December. The Associated Society of Locomotive Engineers & Firemen had threatened a strike as from April 24 unless the Commission revealed its proposals, but on being apprised of these called the strike off. More serious is the attitude of the unions towards a new wages structure. The latter, it was agreed at the time of the December settlement, was to be formulated with a view to correcting anomalies and to giving added incentives; and as it was also agreed to examine jointly ways of effecting economies so as to reduce operating costs, and it was made quite clear that the Commission at the turn of the year was not in a position to grant further wage increases without raising its charges, the present attitude of the unions is not promising. It seems to be one of determination to get as big a slice of the cake as possible—however big or small the

cake may be. The National Union of Railwaymen has stipulated a minimum wage rate of 10s. 6d. a week in advance of the present minimum, whilst the A.S.L.E.F., with a membership including a great number likely to gain by increased differentials, wishes for a maximum that provides for this. The reactions of these two unions to the Commission's proposals are not yet known. Meanwhile the Transport Salaried Staffs Association is understood to have rejected the Commission's proposals, objecting that the pay of salaried staff should be negotiated separately and not linked with that of other grades—which seems to be in flat opposition to the agreement to discuss the wages structure jointly between the unions and the Commission.

Retirement of Mr. P. C. Durrant

THE retirement of Mr. P. C. Durrant from the office of General Agent of British Railways in France marks the completion of 48 years of service devoted to Anglo-French railway relations. Mr. Durrant, who was born in France of an English father, was educated in both countries, and is an outstanding example of the Franco-British citizen. With his deep knowledge of Anglo-French railway problems and conditions, Mr. Durrant has also been familiar with all aspects of the evolution of the British Transport organisation. During his long career he has been associated with outstanding names in British transport. That the high French honour of Chevalier de la Legion d'honneur has been awarded to him by the French Government demonstrates the esteem and affection in which Mr. Durrant is held by our historic allies, and the expressions of regret which have been so freely voiced by Mr. Louis Armand, General Manager of the French National Railways, must find an echo this side of the Channel, where, for so long, the excellence of the understanding existent between the French and British railways has been a matter for unthinking acceptance. Mr. H. C. Talbot, previously Agent at Brussels for British Railways, carries with him to his new position the good wishes of both nations in his difficult rôle of following immediately in the footsteps of an exceptionally successful predecessor.

Labour Party Transport Policy

THE railways and transport generally in this country need to be left free to deal with their own problems without political interference, if they are to function efficiently. According to the first of the Labour Party policy pamphlets issued last week in the "Challenge to Britain" series, entitled "British Transport," Labour, if returned to power, must make such amendments of the railway reorganisation scheme, now being prepared under the 1953 Act, "as experience may show to be necessary"; the Conservative Minister of Transport, it is said, may force the British Transport Commission to embody in the scheme provisions which reduce the efficiency of the railways. The pamphlet on the whole approves of the sections of the Act dealing with greater freedom and flexibility in charging; and apart from a statement that the Defence Estimates should bear the cost of keeping lines open because of their strategic value, expresses few intentions as to the railways. This is not, apparently, through any reluctance to meddle. Apart from the fact that the railways still are nationalised and their future organisation still undetermined, the failure of the Labour Party to realise the folly of interference is seen in the threats to re-nationalise road haulage and to revive "area schemes" for passenger road transport.

South African Railways Coal Traffic

FROM the figures of the railway coal traffic receipts of South African Railways & Harbours quoted in this journal from time to time it was to be expected that coal railings in 1953 would prove to be heavy. The total tonnage moved by rail from collieries last year was in fact 25,417,000, compared with 24,855,000 in 1952, an increase of 562,000, with September as the month showing highest production. The industrial development of the Union is

reflected in the total of 18,389,000 tons carried for local consumption, though the greater proportional increase was in the tonnage of shipment coal, 911,000, an increase of 277,000 tons over the previous year. Much of the latter is understood to be shipped through Capetown, which affords S.A.R. & H. a long rail haul from pitheads. Coal from the Union has been shipped to railways in countries far distant overseas; one of the most remarkable effects of economic dislocation in Europe since the war was the supply of South African coal to the Portuguese Railways.

Changes in Railway Charging Law

THAT the new freedom of charging given to the railways under the Transport Act of 1953 is the logical outcome of the re-introduction of widespread effective competition is the conclusion reached by Mr. H. A. Chapman, Assistant Chief Solicitor, British Transport Commission, in a paper on changes in railway charging law read recently to the Railway Students' Association. The lack of competition, he considers, was the prime mover in the regulation and restriction of railways in the 100 years up to 1921. The rapid growth of a railway monopoly in the transport field engendered public fears of the effects which this might have on railway charges. He traced the development of railway law from the Surrey Iron Railway Act of 1801 to the Transport Act of 1953 with special reference to legal restrictions on freight charges and to the bodies set up from time to time to regulate these. Mr. Chapman in the compass of his paper has succeeded in reducing the complex tangle of charging law to a clear line of logical development.

Overseas Railway Traffics

CANADIAN Pacific Railway gross earnings for February were \$32,282,547, a decrease of \$2,849,989 over the corresponding figure last year, and net earnings of \$373,129, compared with \$916,837 for February, 1953. The aggregate gross earnings for the first two months of this year were \$62,527,641, against \$70,898,175 in 1953, whilst the deficit of \$921,669 for January and February, 1954, compares with net receipts of \$1,007,824 a year ago. Gold Coast Railway traffics for February were £330,757, whilst the aggregate for the 47 weeks to the end of February this year is £3,873,657, an increase of £212,015 over last year's figure. Paraguay Central Railway receipts during March remained substantially above those for the corresponding weeks of last year. They rose from G870,031 for the week ended March 5 to £1,077,841 for the succeeding week, fell to G960,262, but rose to G1,015,656 for the week ended March 26, whereas last year they were in the G700,000 range, ending March at G635,000. The railway operating revenues for January of the International Railways of Central America were \$1,476,454, an increase of \$37,594 over last year; net operating revenue was \$345,979, a decrease of \$18,761; and net income at \$196,909 was \$871 lower than for January, 1953.

Further Progress in Apprentice Training

BBRITISH RAILWAYS, as the largest employer of apprentice labour in the country, have been active in providing for the training of apprentices. The opening on April 2 by Mr. J. W. Watkins, Chief Regional Manager, London Midland Region, of the new training school at Wolverton Carriage & Wagon Works, marks a further step forward in such provision. The new establishment is fully equipped with a large workshop with the necessary machines and lecture and film projection rooms. Trainees, who are accepted on leaving school, will receive practical instruction in workshop conditions for a full year in joinery, coach body building, welding, painting, and electrical work. At the end of the 12 months course in the training school, apprentice trainees will be transferred to the works, where training will be continued up to the age of 21. The training will follow a carefully planned schedule which guarantees every apprentice

being given the same opportunity in accordance with the principles of the progressive system of workshop training which operates throughout the works.

Luxembourg Timetables

AMONG European timetables there are few more clear, concise, and informative than those of the Luxembourg Railways, or C.F.L. The Grand Duchy is traversed by a number of international passenger routes; from the city of Luxembourg these radiate to Thionville, Metz, Strasbourg, Basle, and beyond; to Longwy, Rheims, and Paris; to Arlon, Namur, Brussels, and Ostend; to Trois Vierges, Liège, Maastricht, and Holland; and to Wasserbillig, Trier, and other German cities. International tables therefore figure strongly in the C.F.L. *Indicateur Officiel*. But the 12 standard-gauge and two narrow-gauge routes of the C.F.L. are clearly tabled, with the many services worked by diesel railcar plainly marked; and these are supplemented by tables of the nine bus routes operated by the C.F.L. and the 53 operated by private enterprise. In the 192 pages of 7 in. by 4½ in., forming a volume only quarter-of-an-inch thick, are provided international tables ranging from Stockholm to Barcelona, Rome, and Istanbul; tables of certain internal main lines connecting with the international routes in France, Italy, Belgium, and Holland; first, second, and third class fares from Luxembourg to 65 stations in 12 countries; the C.F.L. internal fare chart; the Luxembourg station arrival and departure list; and a folding map of the system. A good florin's worth.

Grinding Trains for Corrugated Rails

ROARING rails on the main lines along the Rhine of the German Federal Railway followed by the "Rheingold" and other expresses between the Hook of Holland and Basle were the subject of comment in this journal last summer. Measures taken by the Federal Railway to eliminate roaring rail, in so far as it has been established that corrugation is the cause, include *schleifzüge*, or rail grinding trains. The first of two such trains was put into service last month. Of the 28,000 miles of through running lines in Western Germany, some 11,000 are corrugated to such a degree as to produce roaring rail. The rail grinding trains, hauled by diesel locomotives, are equipped with generators, compressors, fuel cisterns, workshops, and living accommodation, and are designed to move at 2 m.p.h. with their grinders in action. As the damage caused by rail-corrugation is estimated at DM. 20-30 million a year, this development is watched with considerable interest.

Control of Gippsland Line Substations

REMOTE supervisory control has played an essential part in permitting full advantage to be taken of the possibilities of unattended operation inherent in the pumpless, air-cooled mercury arc rectifier. Much progress has been made in the speed with which switchgear is controlled and indications of its condition are received, without departing from the principle of using a single pair of wires for the control circuit. The 16 substations and 12 track-sectioning cabins on the Gippsland line of the Victorian Railways extend over a distance of some 97 miles but are under supervisory control from one centre at Warragul. Voice-frequency transmission is used for the control and indication signals because the distances are too great for d.c. operation. In this installation, supplied by the General Electric Co. Ltd., control impulses and return indications are sent simultaneously over the same pair of wires, so that the operator sees the result of any action he initiates virtually instantaneously with operating the pushbutton. Other aspects of the Gippsland project were described in our issues of January 8 and January 22, and a detailed account of the whole scheme has been given by Mr. C. G. H. McDonald, Assistant Chief Electrical Engineer, Victorian Railways, in the electric traction edition of the *International Railway Congress Association Bulletin* for March.

Hand or Automatic Notching

FOR some duties to which electric locomotives are assigned automatic acceleration is convenient, but many designs have so wide a sphere of application that hand control is necessary, and is accepted as a compromise for all types of service. It is possible, however, to provide both facilities, and one method of doing so without complicating manipulation of the controller with extra handles is seen in the French National Railways high-speed Bo-Bo locomotives Nos. 9001 and 9002, described in our December 25, 1953, issue. Here the controller handwheel can be moved to "manual" and "automatic" positions associated with its basic series-parallel and parallel settings. When starting under hand control, the controller is moved from "off" to "series-parallel manual," whereupon the equipment notches up one step. Subsequent notches are taken by moving the handwheel back to "series-parallel" and forward again to the "manual" position. Similar procedure is followed in parallel. The "automatic" positions in each grouping are beyond the manual settings, while moving the controller one step towards off from either grouping causes the equipment to notch back automatically. Automatic notching up is used generally for restoring power after interruptions, and motormen continue to prefer hand control for starting in all circumstances.

Canadian National Railways

THE annual report of the Canadian National Railways for 1953, signed by Mr. Donald Gordon, Chairman & President, shows that at the end of the year a surplus of \$244,017 was available for payment as a dividend on preferred stock held by the Canadian Government. Higher freight rates helped to raise operating revenues to a record level, but the gain was more than offset by a decline in traffic and the impact of increased wage rates on operating expenses. Other income accounts showed an improvement, and the result was a surplus which, although larger than that of 1952, is described as "disappointingly small." Operating revenues in 1953 reached a new record total of \$696,622,451, an increase of 3.2 per cent on the 1952 figure. At the same time, operating expenses rose by 3.8 per cent to \$659,049,086, the highest total yet. As a result, net operating revenue dropped by \$2,800,000 to \$37,573,365. After payment of \$9,242,022 in taxes, equipment, rents and other income charges, \$28,331,343 was available to meet interest charges totalling \$28,087,326. This left a surplus of \$244,017, compared with \$142,327 in 1952. The principal results are compared below with those in 1952:—

	1952	1953
Passenger train-miles	25,533,678	24,949,141
Goods train-miles	49,541,512	46,883,109
	\$	\$
Goods revenue	536,723,241	553,618,614
Passenger revenue	48,466,128	45,916,272
Total operating revenue	675,219,415	696,622,451
Operating expense	634,852,915	659,049,086
Net operating revenue	40,366,500	37,573,365
Taxes, rents, etc.	16,061,052	9,242,022
Interest on public bonds	21,848,906	21,575,180
Government interest	2,314,215	6,512,146
Deficit	—	—
Surplus	142,327	244,017

The volume of freight traffic handled in 1953, measured in revenue net ton miles, declined by 4.6 per cent from the record of 1952. Revenue tonnage amounted to 86,500,000 tons, a drop of 3.9 per cent, and the average haul decreased from 427 miles to 424 miles. The net decline in tonnage was more than accounted for by reductions in pulpwood, coal, grain and grain products. The major increase in tonnage occurred in motorcar parts, chiefly on Grand Trunk Western lines. Moderate increases were shown in other manufactured and miscellaneous commodities, sand and gravel, and iron ores, and concentrates. Freight rate changes, as well as changes in the composition of traffic, caused the average revenue per ton mile to rise from 1.397

to 1.509 cents. Passenger revenues, reflecting a reduction in traffic volume, fell by 5.3 per cent to \$45,916,272. The number of passengers carried, 18,080,958, was down four per cent.

Operating expenses rose by \$24,200,000 in spite of a better operating performance and the institution of economy measures to adjust costs to the lower levels of traffic. This is attributed to the effect of wage increases on payroll costs, which accounted for 61.1 per cent of total operating expenses and absorbed 57.8 cents of every dollar earned in 1953. Higher wage rates alone added \$32,800,000 to operating expenses.

New records were established in freight train performance in 1953, largely as a result of the increased use of diesel locomotives. Heavier trains were moved at higher speed than in any previous year, and average gross ton miles per train hour rose 9.1 per cent to 31,980, a record. The average on-time record of principal passenger trains was up nearly seven per cent from 1952 and better than in any other year since 1940.

As part of the five-year diesel programme (1952-56), 110 diesel units were placed in service during 1953, making a total of 503 on hand at the end of the year. New developments in motive power were watched, and, the report says, "while the results so far do not call for modifications in the current programme, plans for the future are sufficiently flexible to enable the company to take full advantage of technological improvements." Early in 1954 the C.N.R. began to take delivery of the 359 coaches ordered in 1952 and 1953. A self-propelled Budd diesel railcar delivered late in 1953 is in regular service between Newcastle and Fredericton, New Brunswick. A total of 2,152 box cars went into service.

Increased iron ore movements between Atikokan and Port Arthur will be accommodated by the installation, in hand during the year, of centralised traffic control on 106 miles of single track and automatic block signals on 36 miles of double track. Automatic block signals were also extended over 74 miles of the main line between Jasper and Vancouver, bringing to 233 the total mileage so equipped in this area. The current programme, due for completion in 1957, covers the provision of automatic signals on all 512 miles of main track in this mountain territory. Although 576 track miles of new rail were laid, this figure was far short of the objective for 1953, a deficiency attributed to the inadequate delivery of new rail. The rearrangement and extension of track in Turcot yards, Montreal, neared completion, and plans were laid for the modernisation of strategic yards in all regions of the System. Additional facilities for servicing and repairing diesel locomotives were provided.

Further economies were made in 1953 through studies of internal methods and procedure. The C.N.R. continued to play an important role in Canadian economic development. It built 225 industrial sidings, spurs, and extensions, totalling 60 miles in length. Trackwork on the new branch from Sherridon to Lynn Lake in Northern Manitoba was completed on schedule, and by the end of the year regular trains were carrying ore concentrates from the new mine at Lynn Lake. Clearing of the right-of-way for the 46-mile line from Terrace to Kitimat, in British Columbia, was almost completed at the end of the year and more than half the grading was finished. Contracts were awarded for the diversion of 14 miles of line in connection with the construction by the Federal government of the Canso Causeway, which will carry the C.N.R. from Nova Scotia to Cape Breton Island.

Innovations were introduced to make C.N.R. services more attractive. These include incentive passenger fares, package tours, new fast schedules for diesel-hauled goods trains, extension of the trailer-on-flat wagon service, and expansion of co-ordinated lorry-and-rail operations. Plans for simplifying the corporate structure of the C.N.R., which now comprises 79 individual companies, made progress. On the basis of studies completed during the year, 19 companies were selected for amalgamation early in 1954. The ultimate objective is the formation of a single corporate entity to conduct the entire rail operations of the System.

Translating Railway Terms

THE valuable work being done to facilitate understanding between railway officers by ensuring that the technical articles, reports, and other documents exchanged between them shall be as clear and accurate as possible when translated into other languages is described by Monsieur J. Tougne, Director of the International Railway Documentation Bureau, in the January issue of the *Bulletin* of the International Union of Railways. This is far from a recent problem. With the founding of the International Railway Congress Association in 1885 the rendering of many technical railway papers into different languages began to be undertaken systematically. The official language of the Congress was French, as it had been from the first under the special patronage of the Government of Belgium, where its headquarters have been located ever since, while at any Congress meetings themselves the language of the country where one was being held also was admitted as official, though it was the custom regularly to provide for others such as German, which would come naturally as a second language to representatives from certain countries such as Hungary. French, German and English editions of the *Bulletin* of the Association came eventually to be issued.

The lack of reliable dictionaries covering the terms used in railway engineering and operation was keenly felt, and some attempts were made to meet it. A dictionary of such terms in French and English was published by Lucien Serrailier in London in 1897. It was a painstaking piece of work and proved very helpful. A few years later the railway volumes of the long well-known Schlomann six language technical dictionaries did much to help the translator. One of his greatest difficulties is that practice, in some sections of railway engineering at least, is so different between the various countries that some items cannot be translated by a simple expression but need a whole sentence to explain them. This is particularly marked in the matter of signalling.

After the 1914 war the movement towards greater international co-operation, which affected many aspects of public life, received support from the various railway associations, such as the Congress and the International Union of Railways, established in 1922 to deal with other aspects of this important question. A great increase took place in meetings between railway officers of all classes and in the exchange of specialised information between them, which helped to make the need for reliable glossaries and dictionaries more pressing and has led to the work now being undertaken by the Union. One part of that is the listing of about 1,000 terms used in the regulations of that body, covering traffic, accountancy and exchange matters in French, English, German and Italian, under French alphabetical order. To avoid unnecessary work terms for which good ordinary dictionaries can fairly be relied on are not being included. A draft is now under discussion among the various administrations with a view to incorporating helpful additions.

British representatives had suggested that the special character of signalling work made it particularly advisable to draw up a separate vocabulary for it and a considerable amount of work has been done towards one. To obviate the difficulties already mentioned it was decided to issue four editions each commencing with its own key language, somewhat on the principle used in the de-code of the International Code of Signals for marine service. When necessary a term in the key language is rendered by an explanation of how the item in question actually functions, so that the foreign reader cannot fail to comprehend what is meant and whether there is an actual term for it in his own language. To know therefore precisely what, say, an Italian signalling expression means it will be sufficient to turn to the edition using that language as the alphabetical key. The English edition is already available and a glance shows how much patient work must have gone to its compilation.

The Union is also preparing a vocabulary of about 5,000 expressions used in its international work, referring

especially to the exchange and reciprocal use of rolling stock. This will be in two volumes, the second being the more technical; Polish and Russian are to be included, giving six languages. Finally a complete general railway dictionary is to be produced, to include Spanish, based on a first draft in French containing some 6,000 entries, now under discussion. Latin-American renderings are to be specially included as railway terms often are not the same in, say, Argentina, as they are in Spain, while arrangements will be made to cater for similar variations as occur, for example, between France and French-speaking Switzerland, or Great Britain and North America.

British Transport Commission Traffic Receipts

THE freight, parcels and mails receipts of British Railways for Period No. 3, the four weeks ended March 28, at £25,961,000 were only £1,270,000 above the corresponding figure last year. Mineral receipts barely exceeded the total for Period 3 of 1953. Without the 10 per cent increase in rates as from March 1 merchandise and coal class traffics would have shown a reduction compared with a year ago. In estimating the effect of the rates increase, however, on merchandise and parcels traffics, account must be taken of the limitation of the increase to 10s. a ton for goods train traffic and for perishables by passenger train. There seems to have been a considerable drop in merchandise and parcels traffic offering compared with last year.

	Four weeks to March 28		Incr. or decr.	Aggregate for 12 weeks		Incr. or decr.
	1954	1953		1954	1953	
	£000	£000	£000	£000	£000	£000
Passengers—						
British Railways ...	7,245	7,038	+ 207	20,727	19,956	+ 771
London Transport—						
Railways ...	1,461	1,388	+ 73	4,319	4,110	+ 209
Road Services ...	3,873	3,699	+ 174	11,237	10,662	+ 575
Provincial & Scottish buses ...	3,351	3,266	+ 85	9,785	9,551	+ 234
Ships ...	181	171	+ 10	530	547	- 17
Total passengers ...	16,111	15,562	+ 549	46,598	44,826	+ 1,772
Freight, parcels & mails—						
British Railways—						
Merchandise & live- stock ...	9,497	8,961	+ 536	26,219	25,774	+ 445
Minerals ...	3,772	3,730	+ 42	10,732	10,765	- 33
Coal & coke ...	9,609	9,046	+ 563	27,082	26,541	+ 541
Parcels, etc., by pas- senger train ...	3,083	2,954	+ 129	8,645	8,493	+ 152
Total British Railways ...	25,961	24,691	+ 1,270	72,678	71,573	+ 1,105
British Railways C. & D., etc. ...	984	945	+ 39	2,762	2,713	+ 49
Others* ...	6,590	6,702	- 112	19,310	19,131	+ 179
Total freight, parcels and mails ...	33,535	32,339	+ 1,197	94,750	93,417	+ 1,333
TOTAL ...	49,646	47,900	+ 1,746	141,348	138,243	+ 3,105

* Inland waterways freight, haulage and ships

The grouping together, for reasons discussed in our issue of March 19, of the British Transport Commission's road haulage, canal freight and ship cargo receipts as "others" precludes anything but a guess at the reasons for the drop of £112,000 under this heading for Period 3 of this year. One factor may well have been the sales and impending sales, under the Transport Act of 1953, of road haulage units.

In passenger traffic the receipts under all heads were much as for this period of 1953. There was no apparent increase over last year's figure in London Transport railway receipts as the result of the cheap evening return fares introduced on January 25; increased receipts from the latter in any case would be small in relation to total receipts. London Transport road services during this period did rather better than the B.T.C. provincial and Scottish bus undertakings, as they did in Period 2. The differences, however, are small, and differences in weather in different parts of the country probably affected road travel. As ship

passenger receipts include those from all marine services, which vary greatly in their traffics at this season of the year, no comment thereon is possible.

PERCENTAGE VARIATION 1954 COMPARED WITH 1953

	Four weeks to March 28	Twelve weeks to March 28
British Railways—		
Passengers ...	+ 2.9	+ 3.8
Parcels ...	+ 4.3	+ 1.7
Merchandise & livestock ...	+ 5.9	+ 1.7
Minerals ...	+ 1.1	- 0.3
Coal & coke ...	+ 6.2	+ 2.0
Total ...	+ 4.6	+ 2.0
C. & D. services ...	+ 4.1	+ 1.8
Ships (passengers) ...	+ 5.8	- 3.1
British Road Services, Inland Waterways and Ships (cargo) ...	- 1.6	+ 0.9
Road Passenger Transport, Provincial & Scottish ...	+ 2.6	+ 2.4
London Transport—		
Railways ...	+ 5.2	+ 5.0
Road Services ...	+ 4.7	+ 5.3
Total ...	+ 4.8	+ 5.3
Aggregate ...	+ 3.6	+ 2.2

The New Woodhead Tunnel

THE new double-line Woodhead tunnel, carrying the Manchester-Sheffield main line of British Railways under the Pennine Range, was completed in October last and is the third longest railway tunnel in the country. It replaces two centenarian single-line tunnels, the maintenance of which had become uneconomical, and is aligned parallel to and 100 ft. southward of the southern single-line tunnel throughout almost the whole of its 3 mile 66 yd. length. Details of the construction work involved in this national engineering achievement are given in a paper entitled "Woodhead New Tunnel: Construction of a Three-mile Main Double-line Railway Tunnel" presented for discussion at the Institution of Civil Engineers on March 16 by Messrs. P. A. Scott and J. I. Campbell.

The soil through which boring was necessary consisted of contorted and faulty shale and blocky sandstone, and it was realised at the outset that contractual agreement would have to be on a cost-reimbursement basis. Actually, the shale proved even more treacherous than expected, and two serious rock-falls occurred before excavation had proceeded far beyond both portals. It was first intended to drive headings from the portals and from three vertical shafts about 500 ft. deep, but due partly to the difficulty in obtaining shaft-sinking headgear, the idea was abandoned in favour of radial drilling outwards from a 12 ft. x 12 ft. central pilot heading. However, this method proved unsuccessful in this particular rock and instead, a series of by-pass tunnels or adits were driven as haulage ways parallel to and 50 ft. south of the pilot tunnel; this method proved successful. It was suggested by the by-passing of the rock-falls. Cross connections with the pilot-tunnel were provided at intervals as required, and eventually a system of 9,500 ft. of by-pass tunnel gave access to nine enlargement faces; the work was almost always difficult and was complicated by rock-falls in the by-passes.

To combat the rottenness of the rock the roof had to be specially-strongly supported with heavy steel framing except in some of the sandstone, and overbreak necessitated a considerable increase in the thickness of the mass-concrete lining over and above its 21-in. minimum designed thickness. The concrete was batched dry outside the tunnel and carried to mixers at the working faces by 2-ft. gauge trains. After mixing, it was pumped by up to six 4-in. pumps behind travelling steel shuttering, also running on 2-ft. gauge tracks; the haunch concrete was placed first and then the walls and arching in one operation. The arch was subsequently grouted tightly throughout to prevent any rock movement developing as a result of the concrete shrinking away from the rock face, and to fill any gaps that might have been overlooked.

In our experience, such shale as appears to have been encountered at Woodhead is comparatively stable so long

as it is dry, but moisture quickly enters the interstices between the layers, the surfaces of which disintegrate to mix with the water as a muddy lubricant, causing one layer to slide over the surface of another, and produce general instability. A very moderate rainfall is often sufficient to produce these treacherous conditions if the shale is really bad.

The Era of Diesel Motive Power

(By a correspondent)

WHEN the Chicago, Milwaukee, St. Paul & Pacific Railroad electrified a section of its main line through the Rockies, it announced that "the electrical era in railroading was ushered in—the last word in scientific transportation." This forecast, made in 1916, proved to be wide of the mark. Today the Milwaukee operates electrically only 662 of its 10,667 route miles. The Pennsylvania's powerful electric locomotives work intensely 665 miles of road carrying a dense traffic in its Eastern Region, but no other line-haul railway has electrified more than 136 miles of road. Altogether the U.S.A. railways in Class 1 run electric services on 2,600 miles of road, little more than one per cent of the total mileage they operate. During the years before the United States entered the second world war, electrification failed to oust the steam locomotive; after the war diesel motive power superseded steam with startling rapidity and occasionally displaced electric traction on short lengths of line.

The upsurge of the diesel on the U.S.A. railways is perhaps the most dramatic development in railway working during the last 20 years. In 1934, when the Burlington and Union Pacific were the first railways to place diesel-electric locomotives in passenger train service, the railways owned 47,400 steam locomotives and 97 diesel units. In 1941, when the Santa Fe and Southern were pioneers in using diesels to haul main-line freight trains, the stock of steam locomotives was 39,600 and diesel units numbered 1,267. By the end of 1948 the steam locomotive stock dropped to 32,610, while the number of diesel units rose to 8,100. During the next five years steam engines were scrapped on a wholesale scale until on January 1, 1954, only 11,700 were left and 1,230 of the depleted stock were under repair. The railways will rely this year upon 16,370 diesels (complete as operated) which in 1953 worked 79 per cent of passenger train car miles, 73 per cent of gross freight ton-miles, and 83 per cent of locomotive hours in yard service.

A few comparative statistics for 1948 and 1953 will show how mobility improved, as diesel motive power expanded. The daily mileage of active passenger locomotives increased from 221 to 287 and passenger train speed rose from 36.7 m.p.h. to 39. The daily mileage of freight locomotives increased from 117 to 133 and freight train speed rose from 16.2 m.p.h. to 18.1, though the train load of 1,315 tons in 1953 was a record and 139 tons greater than the 1948 load. Another record was a 25 per cent increase in "net ton-miles per freight train-hour" from 18,780 to 23,570; last year, on an average, an American freight train did 17 times as much work in an hour as a British train. These performances were made possible by the efficiency of the diesel-electric, which, complete as operated, had an average tractive effort of 83,100 pounds, 38 per cent over the steam locomotive's average and 24 per cent above the complete electric locomotive's average.

The cost to the U.S.A. railways of installing the diesel-electric as their general utility locomotive has been heavy, but has proved worth-while. In the eight years after the war, 1946 to 1953, they incurred capital expenditure to the amount of \$9,076 million. More than 70 per cent of that sum was spent on equipment and especially on diesel-electrics. Over the five year period to 1951, the average price of a diesel passenger unit was about \$200,400 and of a diesel freight unit about \$157,200. Complete diesels, composed of three or four units, might cost over \$500,000, nearly double the average price of a freight

steam locomotive. The high initial expenditure on diesels was justified by their capacity to perform so much work that frequently one diesel replaced two steam engines and the total stock of locomotives of all types was reduced in number year by year. At the end of 1951 the railways owned 34,217 locomotives, at the end of 1952 they had 31,225 and at the end of 1953 only 28,674—a saving in two years of 5,543 locomotives, or 16 per cent of the 1951 number.

An impression prevails in some railway circles in this country that diesels succeeded in the States because some locomotive runs there are from 1,000 to 2,000 miles in length. The long-distance passenger and freight trains of the Santa Fe, Southern Pacific, Union Pacific, Milwaukee, and similar railways in the Western District are particularly well suited for diesel traction, but are in a class apart

from train services provided by railways in the Eastern District and Southern Region where traffic is dense. Only 44 of the 132 Class 1 railways in the States operate more than 1,000 miles of road and 29 railways, which have dispensed with steam power entirely, operate an average road mileage of 660. The latest railway to become 100 per cent diesel was the Norfolk Southern, a freight line operating 620 miles of road near the east coast. Since 1947 it gradually replaced 48 steam locomotives by 31 diesels and was recompensed by a decrease of 6 per cent in operating expenses last year. Again the Ann Arbor, largely a freight line with 294 miles of road in Michigan, abandoned steam power and increased its earnings by 75 per cent in 1953. Obviously considerations other than length of haul weighed with the U.S.A. railways in adopting diesel motive power wholeheartedly.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Modern Locomotive Practice

March 25

Sir,—I read with interest Mr. Rice's comments (in your March 19 issue) on the article in your issue dated March 5, in which it was suggested that the new British Railways three-cylinder 4-6-2 type locomotive offers an opportunity for the further consideration of compound expansion. Mr. Rice suggests that the 21-in. outside cylinders of the Midland 4-4-0 type compound locomotive are the largest which can be accommodated within the British loading gauge and that the cylinder h.p. obtainable from these locomotives approaches the maximum to be expected from a British three-cylinder compound. This overlooks the extent by which cylinder performance in modern steam locomotives has been improved as a result of the provision of direct steam passages of large section, long-lap piston valves or poppet valves, and improved draughting arrangements.

In Mr. E. L. Diamond's paper "The Development of Locomotive Power at Speed," read to the Institution of Mechanical Engineers in 1947, it was stated that the power developed per unit of cylinder volume in the 250-400 r.p.m. speed range (54-86 m.p.h. with a locomotive having coupled wheels of 6 ft. dia.) had been doubled in recent years. Mean effective pressure curves reproduced in the paper showed that, whilst a Midland Railway superheated 4-4-0 of 1917 developed 31 per cent of its basic m.e.p. at 300 r.p.m. (72 m.p.h.), the converted "Royal Scot" class 4-6-0 of 1944 developed 61 per cent of its basic m.e.p. at the same rotational speed and cut-off.

Similarly, the original Paris-Orleans compound 4-6-2s built in 1909 developed 42 per cent of their basic m.e.p. at 300 r.p.m. (68 m.p.h.), whilst the first series of Chapelon rebuilds of the same engines developed 72 per cent of their basic m.e.p. at the same speed and cut-off. The enlarged poppet valves and Willoteaux piston valves with double admission and exhaust, fitted to the later Paris-Orleans 4-6-2 and 4-8-0 rebuilds, enabled cylinder performance to be improved still further.

A compound locomotive with these refinements of design and with cylinders of equal size to those of the Midland engines should be capable of considerably higher maximum cylinder h.p. than can be developed by these locomotives. This assumption is supported by the cylinder performance of the French National Railways three-cylinder 4-8-4, which uses the Smith system of compounding. The Chapelon rebuilt 4-8-4 has one h.p. cylinder 23.6 in. × 28.3 in. and two l.p. cylinders 26.8 in. × 29.9 in. The working pressure is 290 lb. p.s.i. The superheated Midland compound 4-4-0s have a cylinder volume 55 per cent of that of the French engine, and assuming equivalent cylinder performance and allowing for the lower working pressure of 200 lb. p.s.i. should be capable of developing about 40 per cent of the maximum

cylinder h.p. of the 4-8-4. The last-mentioned has sustained 5,000-5,500 i.h.p. for long periods and, on this basis, the Midland compound should be capable of 2,000-2,200 cylinder h.p. It is very doubtful, however, whether a Midland compound has ever developed cylinder h.p. exceeding 1,500 even momentarily, understandable as the basic design is now nearly 50 years old.

Assuming British loading gauge limitations restrict the dia. of outside cylinders to 21 in., it is possible to calculate the maximum cylinder h.p. to be anticipated with a Pacific having one h.p. cylinder 18 in. × 28 in. and two l.p. cylinders 21 in. × 28 in., with a working pressure of 290 lb. p.s.i.; the ratio of h.p. to l.p. cylinder volumes being 1:2.72, as in the S.N.C.F. 4-8-4, which shows an approximately equal division of work between all three cylinders at maximum power output.

The cylinder volume would be 58 per cent of that of the French engine and, assuming equivalent cylinder performance, sustained power outputs of 2,900-3,200 i.h.p. should be attainable. With steel fireboxes and the universal application of feed water treatment, working pressure of 290 lb. p.s.i. should cause no difficulties.

The provision of a starting valve, permitting the h.p. cylinder to exhaust direct to atmosphere and admitting boiler steam to the l.p. cylinders at, say, 60 per cent working pressure, would enable the proposed locomotive to exert a starting tractive effort of about 40,000 lb. with wheels of 6 ft. 2 in. dia. The starting valve could be arranged for automatic operation at maximum cut-off.

British Railways could build a three-cylinder compound 4-6-2 locomotive capable of sustained power outputs up to the maximum which could be applied effectively with an adhesive weight of 66 tons. Maximum sustained power outputs of the order mentioned above much exceed the limit of hand firing.

Experience with the S.N.C.F. compound and simple 4-6-4 type locomotives of comparable design suggests that the former show a fuel economy of about 10 per cent on heavy main-line duties and similar results could be anticipated in a compound 4-6-2 design in Great Britain. There would seem to be a definite case for giving serious consideration to the use of compounding in the three-cylinder 4-6-2 type locomotive now being developed by British Railways for heavy passenger service, especially as this feature would not involve serious complications. Whilst compound locomotives with independently controlled h.p. and l.p. valve gears may be thought to introduce undesirable complications in driving method, it is quite practicable to build efficient compound locomotives with a fixed ratio between h.p. and l.p. cut-offs, as in the most recent S.N.C.F. 4-6-4, 2-8-2, and 4-8-2 compounds.

Yours faithfully,

GEORGE W. CARPENTER

3, Oak Avenue, Manningham, Bradford 8

THE SCRAP HEAP

Incidental Intelligence

Near Colorado Springs a bill-board points out, "The average time it takes a train to pass this crossing is 14 seconds—whether your car is on it or not."—*From "This Week."*

Free Telegraphic Facilities

Britain's telegraph was first used by railway companies; when Disraeli introduced the 1868 nationalisation measure the Lancashire & Yorkshire Railway owned the country's longest telegraph mileage (432). The privilege enjoyed under private enterprise by some railways of sending their wires free was continued by the Post Office. Liberal use was sometimes made of it. F. E. Baines, one-time Surveyor-General for Telegraph Business, recounted how one official wired home: "The railway papers are on my study table. Tell Thomas to water the geraniums."—*From "The Manchester Guardian."*

Extra Passenger

The 8.45 train steamed into Kings Cross and the Queen's Collection, 268 man-eating spiders, echidnas, laughing jackasses, Tasmanian devils, cockatoos, and kangaroos, was helped out on to the platform.

This was the collection of Australian animals, reptiles, and birds, assembled to commemorate the Queen's tour.

Strange barks, coughs and squeals echoed around the station as zoo officials and R.S.P.C.A. inspectors supervised the unloading of man-killing spiders and poisonous snakes.

Mr. C. G. Harwood, of the London Zoological Society, handed over 267 tickets—and made his apologies for the extra passenger—a baby kangaroo dis-

covered in its mother's pouch on the voyage between Sydney and Hull.—*From the "Daily Mail."*

Trick Cyclist

The *E.A.R. & H. Magazine*, the monthly journal of the East African Railways & Harbours, quotes the following telegram sent from Kakira, a station on the main line in Uganda: "One drunk native trespasser found crossing over buffers with his cycle on his shoulders while train in motion."

Reprisal

Two hundred railway gangers with cudgels and iron rods attacked a train near Calcutta. This was their reprisal for a dispute in which passengers threw a group of unruly railwaymen out of their carriage.—*From the "News Chronicle."*

Romantic Rapide

In a small locality on the outskirts of Milan, a pair of newlyweds was waiting to take a train to the city, where they intended to spend their honeymoon. But the slow train which alone deigned to stop at this little station was not due for some hours, and the turtle-doves were disconsolate. Faced with this distress, the stationmaster "forgot" to give a clear road to an express train which was expected. Expresses must respect signals in the same way as even the humblest trains, and it stopped, its steel heart full of rage and the *chef de train* furious at this unbooked stop. However, the young people climbed into a coach, and the *chef de train*, surmising the true reason for this halt, absolved the stationmaster, who, before the express resumed its course, received

from the young bride the kiss which was his due.—*From "La Suisse" quoted by the "Bulletin des C.F.F."*

More Railway Philately

The interest to collectors of railway stamps was referred to earlier this week in *The Daily Telegraph* by Mr. Charles Jewell. The old railway stamps, he states, are not attractive. But they are lithographed, and of interest because of their many defects.

In January, 1920, the rate was raised from 2d. to 3d.; hence new issues and surcharges. In September, it was further raised, hence new fourpennies, and surcharges of 4d. on the threepennies, on the 3d. surcharges, and even on the obsolete twopennies.

Even after grouping, he points out, there are a few new names—three of the four main-line companies, and later the London Passenger Transport Board. In 1940 parcels stamps were used instead.

The cancellations are interesting to philatelists and those with the guard's name are worth looking for.

A Scratch Affair

(Douglas * * * was recently fined £1 at Halifax for chalking "Just married" on a railway carriage.—*See the daily Press, April 3*)

He chalked "Just married" on a train; He won't be doing it again.

To simple souls, like me and you, This seemed a harmless thing to do. Alas, a copper spoiled the sport And Douglas found himself in court.

The evidence was pretty plain— Douglas had scribbled on the train And, when requested up to speak He could but mumble to the beak: "I only did it for a joke,"

Which irked the magisterial bloke.

"Young man," he said, "I cannot pardon Attempts to lead me up the garden, "Nor can such messages hymeneal "Be rightfully considered venial. "It seems you've had the nerve to

tarnish "The nation's most expensive varnish!"

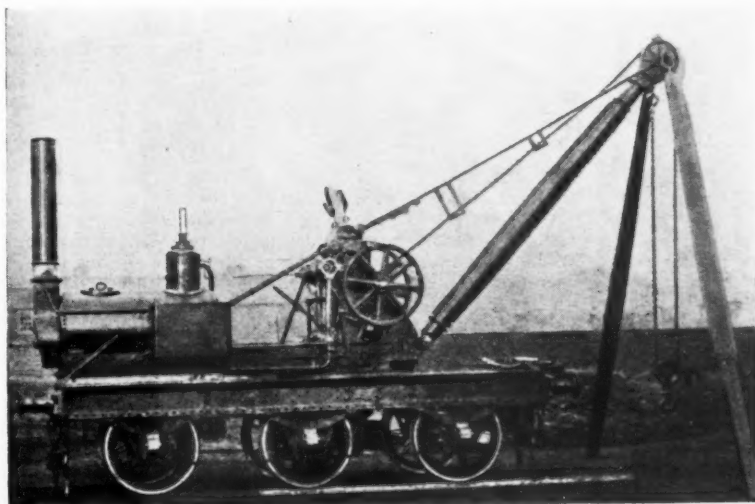
Douglas was well and truly fined And, finding forking-out a bind, Apologised for what he did, But said it wasn't worth a quid. The beak concurred and offered Doug In lieu a buckshee week in jug.

Defacing railway property Is practically *lèse-B.T.C.*, Or so the learned magistrate Seemed to imply, if not to state, What's more, he warned defendant, if He erred again, he'd cop it stiff.

The moral is: shun complications Attending fun and games at stations And, if you want to jest at marriage, Don't do it on a railway carriage; Should any impish urge break out, Make sure there's not a cop about!

A. B.

Early Travelling Crane for India



Travelling steam crane designed and manufactured by Cowans, Sheldon & Company, Carlisle, in 1870, for the Great Indian Peninsula Railway

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

EAST AFRICA

Revenue

The approximate total railway revenue for the first two months of the year was £2,400,000, of which some £1,900,000 was derived from goods and £212,000 from passenger traffic. This result is not quite up to expectations, but it would be premature so early in the year to attempt to gauge the actual against the estimated revenue trends. Passenger revenue was some £17,000 below estimate, because of the emergency. There was an increase of nearly 10 per cent in the imports of general cargo other than cement through Kilindini with a similar increase in tonnage up country. Heavy increases in the movement of low-rated primary produce and raw materials were recorded throughout the system. Exports through Dar es Salaam were much reduced compared with the same period last year; the cause was the drought and the earlier evacuation of smaller export surpluses.

CANADA

Toronto Subway Service Vehicles

The Toronto Transit Commission has converted some of its tramway service vehicles for use on the new Yonge Street Subway, described in our last week's issue. The vehicles include one for rail maintenance, one for track maintenance, one for hauling ballast, snow and miscellaneous heavy equipment, a platform maintenance car, a grinding car, and a snow blower.

ARGENTINA

Funds for Transport

The Executive Power, through the medium of the Ministry of Transport, has handed to the National Transport Undertaking the sum of 300,000,000 pesos to cover the deficit of the component entities (railways, ocean, river, air and road transport) for the year 1953 and adjustments for 1950, 1951 and 1952.

Exhibition of Railway Material

An exhibition of nationally manufactured railway material was held recently at the Presidente Peron terminus of the Mitre Railway, following a similar exhibition at Plaza Constitución, Roca Railway. Both State and private industry were well represented. Among the material exhibited were electrical and signalling spares, wagon bogies, heavy castings for steam locomotives, a fully equipped train control table, models of coaches, level crossing signalling equipment (Argentine patented), and many other ancillary devices.

Pan-American Railway Congress

As the ninth Pan-American Railway Congress will be held in Buenos Aires

in April, 1956, the Government has named a committee to take charge of all the preparatory arrangements. The president is the Administrative Under-Secretary of the Ministry of Transport, Dr. Enrique A. Cárcamo, and the members are the general administrators of the railways and technical officials of the Ministry of Transport. The staff of the nationalised railways has been invited to prepare papers to be submitted to the consideration of the Congress.

UNITED STATES

Double-Deck Suburban Stock

Recently the Chicago, Burlington & Quincy lent to the Southern Pacific one of the stainless steel double-deck "gallery" cars which it uses in its Chicago suburban service. The Southern Pacific, which is considering the introduction of new stock for its dense suburban service in the San Francisco peninsula, has put the car on exhibition at Third Street Station, San Francisco, and has been canvassing its suburban passengers to obtain their reactions to this mode of travel.

Reduction in Service Charges

The abolition of special service charges on the Union Pacific-Chicago & North Western "City of Los Angeles" and the Atchison, Topeka & Santa Fe "Chief" and "El Capitan," and their reduction on the Santa Fe "Super-Chief," have resulted in a similar move by the Chicago, Rock Island & Pacific and Southern Pacific with their com-

peting "Golden State" between Chicago and Los Angeles, via Kansas City, El Paso, and Phoenix. The service charge for Pullman passengers has been cut from \$10.00 to \$7.50; for coach passengers it remains at \$3.50.

As yet there has been no reduction of the service charge on the Chicago & North Western-Union Pacific-Southern Pacific "City of San Francisco," from Chicago to San Francisco, but the decision is doubtless awaiting the inauguration by the Santa Fe of its "San Francisco Chief" early in the summer, with all the latest equipment, including full-length dome cars, from Chicago to San Francisco via Kansas City, Albuquerque, Bakersfield and the St. Joaquin Valley.

U.S.S.R.

Moscow Underground

The Moscow underground railway now carries nearly 2,250,000 passengers daily on almost 75 miles of line. By the recent completion of the Arbat radial extension, with three stations, and the 12½-mile "Outer circle" line 18 of the 25 districts of the city are served.

Construction of a new 12-mile section has been started. It consists of two lines, one from the Central Park of Culture and Rest to Lenin Hills, where the new buildings of the Moscow State University stand, and the other from the Botanical Gardens to the All-Union Agricultural Exhibition Hall.

New Electric Locomotive

The works at Novocherkassk has brought out a twin-unit 3,000-3,300 V



New twin-unit 5,000 h.p. electric locomotive for heavy freight haulage on the Russian railways

electric locomotive for main line freight haulage, which is claimed to have a horsepower of 5,000 at the one-hour rating and to be able to move a 3,500-tonne train up a gradient of 1 in 110. The maximum speed is 90 m.p.h. The chassis is of monobloc construction and there are roller bearings on all axles.

Tests have been completed satisfactorily on the Trans-Caucasian line and the locomotive is now on regular duties on the Southern Urals system.

FRANCE

Level Crossing Abolition

Because of the increase in road traffic between Montbéliard and Sochaux the level crossing at Montbéliard, where the Besançon-Belfort line crosses national highway No. 101, is to be superseded by a subway under the line. The road is to be diverted to pass under the railway a short distance away from the level crossing. To enable work on the subway to go ahead a temporary girder bridge was first constructed; it has now been replaced by a permanent structure. The new bridge deck consists of girders embedded in concrete, and at each end are reinforced concrete blocks to form solid supports with the abutments.

It was necessary to keep the thickness of the bridge deck to a minimum because of the difficulty of installing the founda-

tions below a certain level, and the deck, which covers a span of 11 m. (36 ft. 1 in.), complete with track, has a depth of 1.22 m. (4 ft.). The total weight of the bridge is 900 tonnes.

The replacement of the temporary bridge by the new structure had to be carried out with the minimum interference to rail traffic and took place in seven hours between 8 a.m. and 3 p.m. on a Sunday. The temporary girders were removed by two 45-tonne cranes, while the new bridge was slid into place from the point where it had been constructed, 25 m. (82 ft.) from its final position. The bridge was moved on steel balls, which ran along a channel formed by two bullhead rails placed together. Two 50-tonne electric winches were used. It is hoped to complete work on the road through the subway this year.

WESTERN GERMANY

Semi-Fast Train Supplements

From May 23, the date of introduction of the summer services, the Federal Railway is to discontinue the extra fare payable for travel by semi-fast trains (*Eilzüge*). Supplements will then apply only to "D" and "F" trains. A similar step was taken by the Austrian railways in 1949.

As a result of this change, the trains known as S-trains (*Städte-schnellverkehrszüge*) will be reclassified as

Eilzüge. The S-trains were introduced in May, 1951, to give fast short-distance inter-city services without supplementary fares. The result of this will be a certain reduction in the overall average speed of the E-trains, as some S-trains will automatically become E-trains for the whole of their journey.

The average distance between stops of the D-trains will be reduced slightly by the inclusion in this category of certain existing long-distance E-trains which would otherwise become free of supplement. The longest non-stop run in the new timetable will be that of the "Helvetia Express" from Frankfurt to Hanover, 348 km.

IRELAND

Railbus Service

The C.I.E. service on the Thurles-Clonmel branch is being operated by a railbus. The unit is an old A.E.C. road bus converted to run on rails and has a seating capacity of 30 passengers, as well as luggage accommodation. It is powered by a four-cylinder diesel engine fitted with special Howden-Meredith patent pneumatic steel flanged tyres, and is capable of a speed of 35 m.p.h.

The existing timetable between Thurles and Clonmel remains unaltered, but passengers for main line trains change at Thurles.

Publications Received

Locomotives of the North Eastern Railway. By O. S. Nock. Hampton Court, Surrey: Ian Allan Limited, Craven House. 8½ in. × 5½ in. 200 pp. Illustrated. Price 25s.—An industrious compilation from most of the known sources of information over the last 75 or 80 years, supplemented by numbers of "logs to the last second," this book gives in a fashion suited to the railway enthusiast a précis of all the North Eastern classes built from the time when T. W. Worsdell became Locomotive Superintendent in 1885 until the fusion into the L.N.E.R. in 1923, and deals with the more outstanding classes introduced over the first 30 years from the origin of the N.E.R. Something of the general level of performance of the passenger types and the leading freight classes are included, and the high standard of the two four-cylinder compound Atlantics of 1907 is emphasised. Without exception, the 80 photographs are excellent, and form a remarkable feature of the book.

How to Reduce Absenteeism by Positive Planning. By Oswald Moor. London: Blick Time Recorders Limited, 96-100, Aldersgate Street, E.C.1. Price 2s. 6d.—If a considerable percentage of the 23,000,000 workers in British industry is absent from work, week in and week out, the loss to the country is tremendous. The author of this book-

let, who is Chairman of Blick Time Recorders Limited, has made an intensive study of what he calls "inexcusable absenteeism in industry." Most British firms have no idea of what their absentee rate is and how much it is costing them. Mr. Moor's enquiry reveals a difference of 5.8 per cent between the maximum absence and minimum absence rates and, in the case of women, the loss of time is very much greater. His treatment of the subject, with its original approach, calls for close study by all industrialists, in whatever field they operate.

Industrial Washing and Degreasing Plant.—Edward Curran Limited has issued an illustrated brochure describing various types of industrial washing machines for use in the engineering industry. The equipment is divided into two main groups, those of the cabinet type, which are fitted with jets for washing intricate castings, and continuous machines equipped to spray components carried by conveyor or monorail. The equipment is specially applicable for cleaning petrol and diesel engine cylinder blocks and similar components on the continuous system. Equipment is also available for cleaning and degreasing locomotive components such as wheel seats, one of which is stated to have been supplied to British Railways, for use at Derby Works. Details are also given of various alkali

and emulsion cleaners, and other Curran detergents.

Treatment of Ferrous Metals.—A leaflet issued by British Paints, Limited, gives particulars of a rust inhibitor, the Superlative metal primer, evolved as a result of many years of research in the firm's laboratories. It is claimed that tests have proved the new primer, which contains lead cyanamide, to be as efficient as genuine red lead. The spreading rate is approximately 100 sq. yd.—imp. gal.; the material is packed in 5-gal. drums and one-gal. tins. It is stated the paint does not settle hard, and can be readily stirred to correct consistency after a long period of storage.

Welcome to Ireland for Holidays.—A booklet issued by Coras Iompair Éireann gives details of rail and motor coach tours arranged for visitors this year. The well-known Radio Train will be running day trips from Dublin to Galway or Killarney and several combined rail and road circular tours have been arranged. The rail portion of these is usually by the new streamlined diesel trains equipped with buffets and cocktail bars. These trains bring Cork, Blarney, and Limerick within three hours of Dublin, and Killarney is only just over four hours away. The booklet has an attractive cover in colour, portraying a diesel train and a motor coach of C.I.E.

*Sixteenth International Railway Congress***Review of Electric Traction Systems***Influence of traffic characteristics on electrification costs with alternative forms of power supply*

PROFESSOR DR. ING. C. GUZZANTI, of the General Inspectorate of Road Transport Services, in Rome, has compiled the report on practice in certain European countries and their overseas territories for Question 3 before the International Railway Congress. The question calls for a review of railway electrification systems with a view to assessing their relative merits.

The report observes that the economic aspects of electrification were last dealt with by the congress when it met in Cairo in 1933. At that time the comparison was being made between electric and steam traction, whereas today the different systems of electric traction itself are being investigated. In 1933 the three-phase system was already regarded as superseded and discussion centred on d.c. at 1,500 or 3,000 V., and single-phase a.c. at 16½ cycles. To these the standard frequency (50-cycle) single-phase system has now been added and is of outstanding interest.

Except when a low-frequency a.c. system is supplied from its own generating stations or from converters in a few of the public supply power stations, special high-voltage lines are not essential for railway electrification. Where such lines have been erected for d.c. schemes, it has been because when the railways concerned were converted, existing facilities were insufficient to ensure continuity of supply, or there was a lack of facilities for making connections from the power network to the railway substations. Such distribution systems usually convey power for other users besides the railway owing them and have been of great benefit to industrial development. On the assumption that high-voltage transmission lines would be needed, the reporters at the Cairo Congress of 1933 considered direct current electrification as the most advantageous, but in the present state of industrial power system development the same argument does not apply.

Substation Practice

In reviewing substation equipment, the reporter mentions the use of mercury-arc rectifiers as frequency converters, enabling the overhead system of a single-phase railway to be supplied from the industrial high-voltage three-phase network. Although it is well known that the German railways experimented with an installation of this type at Basle, no information on its characteristics, or on the reasons that have discouraged its further use, was given in replies to the questionnaire.

Considering normal methods of sup-

ply, development has resulted in some rectifier substations being almost as simple in equipment as a.c. substations with transformers alone. The rectifier substation occupies an intermediate place in respect of complexity of controls and maintenance between the rotary converter type and the substation with transformers. The Moroccan Railways, alone of the fourteen administrations from whose replies information has been extracted, mention the use of rotary converters in unattended substations.

The Belgian, Italian, Netherlands, French and German railways were among those replying which were not interested at present in equipping substations for regenerative braking. Replies from Morocco, Algeria, Spain, and Switzerland showed that regeneration was used to a greater or less extent, and it is clear from the variety of systems represented that the factor deciding whether to regenerate or not is the type of traffic and not the method of electrification.

In Algeria and Morocco rotary converters or rectifiers are installed according to whether or not regeneration is required. At one Algerian substation equipped with rectifiers on a section where trains regenerate, it has been considered preferable to install resistances to absorb regenerated power rather than to operate rectifiers as inverters, but the reporter feels that the equipment for switching in the resistances when necessary gains nothing in simplicity over inversion by rectifiers. He concludes that there is some lack of experience of, or confidence in, the rectifier-inverter, and that this would put d.c. electrification, especially at 3,000 V., in a difficult position if regeneration were considered essential.

Unbalanced Loads

Railway electrification at the industrial frequency has provoked much discussion of the unbalancing of the three-phase network by the single-phase railway load. The reporter thinks that it would be premature to express optimism or pessimism in this respect, but that judgment will be possible when the French National Railways scheme between Valenciennes and Thionville is in operation. Accepting that to avoid unbalance the railway load must be small in proportion to the total, he remarks that although the 50-cycle system lowers the level of traffic density at which electrification is justified, the level will still be relatively high. Therefore such electrifications would appear to be appropriate only in areas where indus-

trial development has already created a large consumption of electric power.

The question of overhead supply voltage is considered in another section of the report and it is pointed out that the benefits derived from an increase in voltage do not themselves increase equally on d.c. and a.c. systems because of the effects of reactance in the latter. With similar voltages and overhead systems, d.c. substations can be more widely spaced than a.c., from which it follows that reducing the frequency enables the substation spacing to be increased on an a.c. system.

The upper voltage limit for d.c. is in the region of 3,000–3,400 V., because although rectifiers could handle 6,000 V., there would be difficulties with feeder circuit breakers supplying the track, while in the motive power units it would be necessary to have several motors always connected in series. This would involve more complex wheel arrangements in locomotives, or several motors per axle; and the operation of motor coaches in permanently coupled sets.

Choice of overhead system is independent of the form of supply, being governed by speed of trains, layout of tracks, and climatic conditions. The greater weight of materials in conductors and catenaries for d.c. electrification brings some disadvantages, especially at the lower voltages, but even with the lightest overhead equipment there are factors which limit the practicable length of span. These limitations are such that with the highest voltages and lightest lines of the single-phase system, normally spans are adopted which are no longer than those already used with 3,000 V. d.c.

Usually the overhead systems on the two tracks of a double-track line are mechanically independent, but there are notable exceptions, among them being the Netherlands Railways. Some railways, the Spanish National Railways for example, are considering connecting the up and down supply systems in parallel and so helping to reduce voltage drop.

The reporter draws attention to the trend towards locomotives for high-speed traffic in which the whole weight is used for adhesion. In consequence modern motive power is better adapted to mixed traffic and therefore capable of being used intensively. These results have been achieved in locomotives for all traction systems except certain converter types designed specifically for heavy freight haulage on a single-phase, 50-cycle supply.

Comparisons of horsepower per ton in mixed traffic and freight locomotives

for all systems show single-phase, 16½ cycles, machines in the lead. Actual figures are 39—61 h.p. per ton in the single-phase mixed traffic designs represented in the report and 37 h.p. per ton in the freight classes. The reason is that all these locomotives have commutator motors and therefore need to accelerate rapidly through the zone of poor commutation in order to reach their optimum operating conditions.

Efficiency of Locomotives

It is urged that the efficiency of a locomotive should be judged in relation to total operating costs. For example, if one design of high technical efficiency permits a large saving in energy consumption but only a small economy in cost of operation, while another is less efficient electrically but enables great savings to be realised in working the railway, this second type of locomotive is clearly to be preferred. On these grounds the reporter views with much interest the possibilities of converter locomotives. Although these may be costly to build, their capacity for heavy haulage can reduce the number required and therefore the total investment in locomotive stock. The investment in fixed installations and the economies that may be effected here by appropriate choice of electrification system then become of increased importance.

After describing the characteristics of converter locomotives for single-phase, 50-cycle systems, the reporter refers to 50-cycle motor coach stock. Replies to the questionnaire do not indicate that the standard-frequency motor coach has yet fully proved itself, and further evidence on this subject at the congress from delegates with first-hand experience of it is awaited with interest. It can be said, however, that to be acceptable today any traction system must permit the use of motor coach trains both for local services and long-distance, high-speed working.

The demand of operating departments for simplicity in locomotive stock is recognised as having some justification, but the reporter points out how much the modern d.c. locomotive—usually regarded as the type with least complication—differs from its forerunners. Field control, automatic acceleration, and fully-springborne motors are all features which have had to be brought into its design, but have little in common with the basic conception of a machine with axle-hung motors and a control system having the minimum number of notches.

Economic Comparisons

Costs per mile for electrification in various countries covered by the report are quoted, and have been used by the University of Pisa in calculating on broad lines the cost for electrifying the Milan-Venice line of the Italian State Railways with 3,000 V. d.c. or single-phase, 50-cycle a.c. Trains are numerous but not heavy, and the cost of fixed installations with 3,000 V. d.c. would represent less than 32 per cent of the total

cost of electrification. With a 50-cycle system the fixed installation costs could be reduced by some 57 per cent, while those for motive power would go up by about 14 per cent. The final saving, however, would be barely 9 per cent. If the number of motive power units could be halved, however, there would be a reduction on the total cost of 22 per cent in favour of the 50-cycle system. It seems, therefore, that the deciding factor in the choice of system is the traffic, because if this can be handled by a few trains, heavy when necessary, a system which reduces the cost of fixed installations can realise satisfactory economies in the total cost of electrification.

Life of Equipment

Administrations replying to the questionnaire have given approximate figures for the life of their equipment. For high-voltage transmission lines, the Swiss Federal Railways quote 40 years and the others 50 years, except the Netherlands Railways, which quote 25 years, having all their lines in cables. The Netherlands and French National Railways both estimate 25 years for the electrical equipment in substations, and 33 and 75 years respectively for the substation buildings. Other replies give figures varying from 33 to 50 years for substations as a whole, without distinguishing between buildings and apparatus.

Life of the overhead system as a whole is variously estimated between 40 and 60 years, but the Netherlands Railways break the figure down as 12 years for the contact wire and 40 years for the remainder. Periods of 33—45 years are estimated for motive power units, without distinguishing between locomotives and motor coaches. The reporter considers that the motive power estimates do not sufficiently take into account the effects of obsolescence.

Conclusions

In his conclusion the reporter states two developments in electric traction which are still awaited: (1) improvements in the mercury-arc rectifier to permit d.c. systems to return power to the distribution network with a simple apparatus; and (2) a method of connecting low-frequency single-phase systems direct to the public supply through static phase and frequency converters.

The problem of different electrification systems existing side by side is then discussed. A choice may have to be made between (1) changing locomotives at the frontier (or terminating motor coach trains and transferring their passengers); (2) operating dual-system motive power units; and (3) converting one of the systems. The reporter considers that solution (2) is the least convenient, although (3) is the most expensive. On the other hand (3) may improve operating efficiency and the use of motive power, enabling both the number of units and operating costs to be reduced. Such a solution could hardly be considered where the railways

of different countries are involved, and it may prove unacceptable even within a single system. On this point the French National Railways replied to the questionnaire that "the expense of transforming the d.c. network into single-phase would be higher than the saving which could be realised with the new system of traction."

No alternative is seen to changing locomotives at frontiers between countries with different electrification systems unless dual locomotives are further developed, which will happen only if adjacent countries find it advantageous to exchange motive power units.

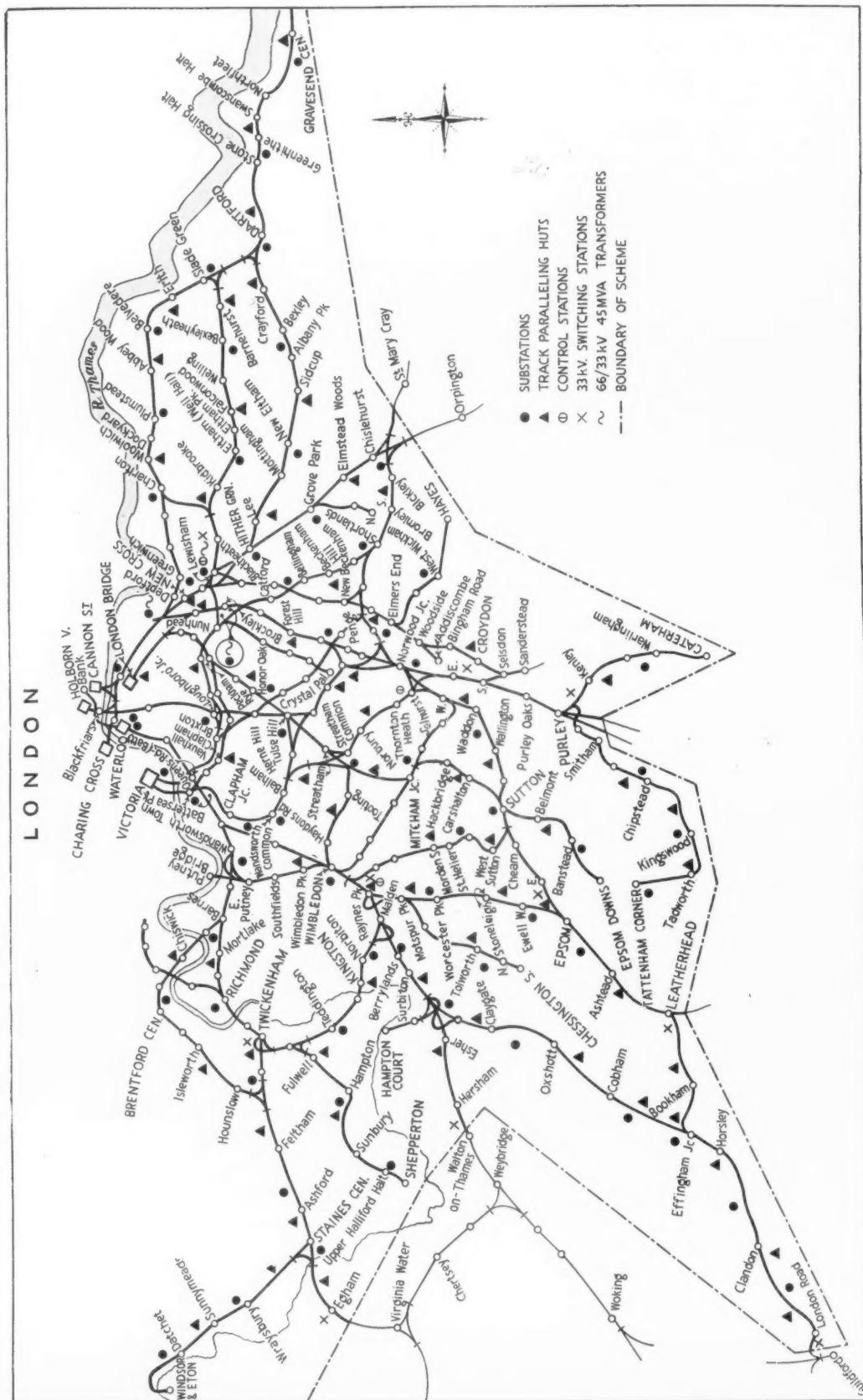
Lastly the reporter asks whether a railway extensively electrified on one of the established systems must forego the advantages claimed for 50-cycle electrification. He does not rule out the possibility of the two systems co-existing and outlines the following conditions making such co-existence possible: (1) The two zones have only a limited number of common stations; (2) traffic density in the 50-cycle zone is lower and can be handled by a limited number of trains; and (3) good use of locomotive stock is possible in both zones.

Individual examination is necessary of every case of this kind, but it is permissible to expect that for the zone with lower traffic the standard frequency single-phase system may be used with satisfaction and economic benefit.

HYDRAULICALLY-OPERATED LOADERS.—Among the hydraulically-operated equipment exhibited at the forthcoming British Industries Fair by F. E. Weatherill Limited will be a ½ cu. yd. capacity hydraulic loading shovel fitted with rear power take-off coupled to the John Allen (Oxford) Limited, Atmos trencher attachment, with a ½ cu. yd. capacity Hi-Tip type loading shovel. This last will demonstrate its ability to load exceptionally high hoppers in a joint display with the 12 cu. yd. capacity mobile hopper weigh-batcher manufactured by Road Machines (Drayton) Limited. Also exhibited will be a two cu. yd. capacity Weatherill hydraulic coke loader, which will be fitted with the largest capacity scoop available with the Weatherill range of machines.

MOORE & WRIGHT SMALL TOOLS EXHIBITS AT THE B.I.F.—The exhibits at the forthcoming British Industries Fair at Castle Bromwich will include a range of micrometers, small hole gauges, telescopic gauges and so on, manufactured by Moore & Wright (Sheffield) Limited. The micrometers feature the latest form of ratchet which is built into the upper part of the thimble, the use of which ensures accurate measurements, specially those of a repetitive nature. This new feature can be supplied to external micrometers of any capacity. Other exhibits will include a series of comparators for measuring small holes and gaps by the use of hardened and spherically-lapped balls. The balls which have free movement and do not wear at any one spot, are moved into position and locked by a precision-finished tapered rod, hardened and ground to obviate wear.

Southern Region Change of Frequency Scheme—2



Route-map of suburban area, showing the position of substations and distribution control arrangements

Southern Region Change of Frequency Scheme—2*

*Supply and feeder distribution system;
transformers, rectifiers and switchgear*



Hither Green substation under construction; English Electric transformers are situated in the foreground

POWER for the new 50-cycle system is obtained entirely from the British Electricity Authority. Four supply points are from Deptford Generating Station at 66 kV. over three-core oil-filled feeder cables of 0.25 sq.

port Commission property are under its ownership; the other portions through public thoroughfares or on British Electricity Authority property, are owned by the Authority. This applies also to the feeders from Wimbledon mentioned

Electricity Authority are at 33 kV. and are taken over the Commission's three-core oil-filled cables of 0.25 sq. in. cross-sectional area, from the British Electricity Authority grid substations at Northfleet (two feeders), Wimbledon (five feeders), and Leatherhead (two feeders), and from its Croydon "B" Generating Station (two feeders—one of which was installed in advance of the change of frequency scheme). From these supply points the feeders are taken to a railway substation and thence distributed to other substations, indicated on the diagram, which shows the complete 66 kV. and 33 kV. system with connections to the 33 kV. existing circuits outside the area. In addition, connection is made at Walton, Guildford, Egham, Leatherhead, Purley, South Croydon, and Chislehurst with the 33 kV. system already installed by the former Southern Railway for its outer area electrification scheme.

Cable System

The 66 kV. and 33 kV. feeder cables are accompanied throughout by a multi-core star-quadrant pilot cable which carries the circuits for the Solkor feeder protection and supervisory remote control as well as the low oil pressure indication for the oil-filled feeder cable, telephones, electric clocks and metering. The H.V.



Converted former 25-cycle substation at Nunhead, showing (left) G.E.C. rectifiers on upper floor, B.T.H. d.c. switchgear on lower floor left, and G.E.C. 33-kV switchgear on right; (right) British Electric Transformer Company transformer equipment in foreground and G.E.C. transformers in background

in. cross-sectional area, whose terminations are in three single-core fluted lead, oil-filled cables, also of 0.25 sq. in. cross-sectional area. The portions of these feeders which are on British Trans-

later. These 66 kV. feeders connect Deptford Generating Station separately to 45 MVA. transformers situated adjacent to railway substations at Nunhead, South Bermondsey, Lewisham, and Brockley.

Other supply points from the British

cables are of the paper-insulated oil-filled lead alloy sheathed and served type, with an impervious layer in the serving, and are not armoured. The pilot cables are armoured, and the number of cores in the pilot varies between 12 and 76 cores. In general the feeder cable,

* Part I appeared in our issue of March 19



G.E.C. 33-kV switchgear, Queens Road (Battersea) substation

with its pilot, is laid in surface reinforced concrete troughing without sand or other filling, and is covered with a reinforced concrete lid. Where there are two feeder cables, one pilot cable usually suffices, and the concrete troughing is divided to give two compartments, the smaller of which takes one feeder cable, and the larger takes the other as well as the common pilot.

The oil-filled cables are continuously supported, hence where the cables are carried over bridges, along parapet walls, or under viaducts, they are placed in asbestos cement tubes which are supported by steel hangers. Where the ground is suitable, the cables are laid direct in the ground at a depth of 1 ft. 6 in. or thereabouts and protected with a reinforced concrete slab laid on the surface above each cable. The cables are manufactured by Pirelli-General Cable Works Limited, which also has a contract for laying the route materials and laying the cables. The concrete troughing, lids, and slabs are manufactured by the Southern Region Civil Engineer's concrete works at Exmouth Junction, Exeter. The total length of feeder cable on the entire scheme is approximately 300 miles. Cable laying began in August, 1952, and approximately 100 miles of cables have been laid and jointed.

Main Transformers

The 66 kV. supply from Deptford Generating Station is taken directly to outdoor 66/33 kV. 45 MVA. transformers, situated at Nunhead, South Bermondsey, Lewisham, and Brockley. The first two are supplied by the British Electric Transformer Co. Ltd., and the second two by the Hackbridge & Hewitt Electric Co. Ltd.

All four transformers are to the same specification and the equipment at each consists of one three-phase 45 MVA. transformer star connected on the

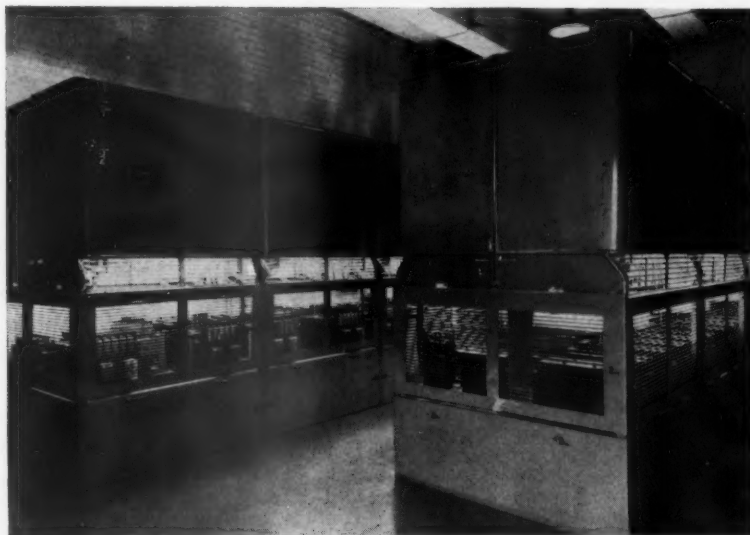
66 kV. side with on-load tap changing equipment in eleven $1\frac{1}{2}$ per cent steps to give normal or up to $4\frac{1}{2}$ per cent increase or down to $10\frac{1}{2}$ per cent decrease in ratio. On the 33 kV. side, the transformer is delta connected and with a separate star-connected earthing transformer, the secondary of which provides 130 kVA. for oil pumps and auxiliary circuits. The neutral point of the earthing transformer is earthed through a convector-type liquid neutral earthing resistance supplied by the British Thomson-Houston Co. Ltd., and is so arranged as to pass 788 amp. for 30 sec. with a current transformer connected between the transformer neutral and the resistor.

Both the main and earthing transformers are equipped with Buchholz pro-

tection, the main transformer being cooled by external coolers through which the oil is pumped. The 66 kV. feeder is terminated in single-core sealing ends on the outdoor structure from which bare copper connections are taken direct to the transformer bushings. The 33 kV. connections are similarly arranged, there being two three-phase circuits in parallel of 0.4 sq. in. single core screened solid-type cables from sealing ends on the structure and connecting to the switchgear in the substation. The 66 kV. cables, the transformer and the 33 kV. cables are protected by Solkor overall protection arranged to trip both the 66 kV. oil-circuit-breaker at Deptford Generating Station and the 33 kV. oil-circuit-breaker at the substation. At Nunhead, South Bermondsey, and Brockley, the 33 kV. switch is, with those on outgoing feeders and transformer connections, placed in the adjacent substation, but at Lewisham it has been necessary to build an independent switchhouse as space in the substation is not yet available.

Substation Equipments

The substation equipments are all to the same specification and contain between one and five pumpless air-cooled mercury-arc rectifier equipments, each rated at 2,500 kW. continuous output on the d.c. side at 750 volts. The rectifier transformers are all of the O.N. outdoor type and are delta-connected on the primary (33 kV.) side with an externally-operated tapping switch to give normal or plus or minus $2\frac{1}{2}$ per cent or 5 per cent voltage correction and in addition internal links to allow the output of the rectifier to be 660 volts or 750 volts. When operating at 660 volts the full load d.c. output is 2,200 kW. The transformer secondaries are arranged in twelve-phase zig-zag connections. A ter-



Hackbridge & Hewitt glass bulb rectifier equipment in service in the substation at Queens Road (Battersea)

liary winding is provided for operating the rectifier cooling fans and auxiliary circuits. Full load output current of the rectifier set is 3,333 amp. d.c. at either 660 or 750 volts, according to the tapping connected on the transformer primary.

The H.V. switchgear is of the indoor metal-clad single busbar type with withdrawable oil-circuit breakers having a rupturing capacity of 750 MVA. A withdrawable 10-kVA. auxiliary transformer with output of 415/230-V. three-phase four-wire is provided on certain feeder units arranged to plug into the feeder side of the unit. The oil-filled three-core feeder cables are brought to stop joints outside the substations and the feeders continue as three-core screened solid type cables to terminal boxes on the back of the switchgear. The connections between

which is providing rectifiers of the glass bulb three-anode type, a rectifier set consisting of seven cubicles, each containing four glass bulbs, giving 28 bulbs per set. The four glass bulbs of each cubicle are connected as a 12-phase set. The contractor for the d.c. switchgear is Bertram Thomas (Engineers) Limited, which has also the contract for the d.c. switchgear in the track paralleling huts on this section. The feeder high-speed circuit breakers are calibrated for a range of overcurrent settings from 5,000 to 10,000 amp.

The circuit breakers are latched in and are not provided with a hold-on coil. They have a relay to reduce the trip value in sympathy with a drop in voltage, to the extent that if the track voltage falls to 40 per cent, the circuit breaker will trip on zero current. This feature is of value in making the cir-

although mechanically independent, is arranged electrically to operate as one unit. The circuit breakers have hold-on coils energised from the track supply so that a falling voltage trip characteristic is obtained inherently at a value dependent on the overcurrent setting of the breaker. The feeder high-speed circuit breakers are calibrated for a range of overcurrent settings from 5,000 to 10,000 amp. The battery equipments are supplied by Chloride Batteries Limited.

The H.V. switchgear on the Eastern Section is supplied by the British Thomson-Houston Co. Ltd., and is of its Class "MF.36" metal-clad type. The transformer and rectifier equipments are supplied by the English Electric Co. Ltd., and are of the six-anode air-cooled, sealed, steel tank type arranged in pairs on each side of a



Hackbridge & Hewittic transformers, Queens Road (Battersea) substation

the H.V. switchgear and the main transformer also take the form of three-core screened solid type cable.

The d.c. switchgear consists of truck-mounted high-speed circuit breakers with a continuous rating of 3,000 amp. for the feeders and of 5,000 amp. for the rectifiers. The trucks for the high-speed circuit breakers are 2 ft. in width. The feeder circuit breakers are arranged to trip on forward current, the rectifier circuit breakers on reverse current. The rectifiers are protected against overloads by inverse definite minimum time overcurrent relays and by instantaneous overcurrent relays all mounted on the H.V. switchgear. Instantaneous earth leakage relays are also provided and likewise mounted on the H.V. switchgear for the protection of the rectifier transformer.

The substation contracts have been allocated in three groups, Western, Central and Eastern. On the Western Section, the contractor for the H.V. switchgear is the General Electric Co. Ltd., which is providing its KSB.7 switch units. The contractor for the rectifiers and transformers is the Hackbridge & Hewittic Electric Co. Ltd.,

which is providing rectifiers of the glass bulb three-anode type, a rectifier set consisting of seven cubicles, each containing four glass bulbs, giving 28 bulbs per set. The four glass bulbs of each cubicle are connected as a 12-phase set. The contractor for the d.c. switchgear is Bertram Thomas (Engineers) Limited, which has also the contract for the d.c. switchgear in the track paralleling huts on this section. The feeder high-speed circuit breakers are calibrated for a range of overcurrent settings from 5,000 to 10,000 amp.

The circuit breakers are latched in and are not provided with a hold-on coil. They have a relay to reduce the trip value in sympathy with a drop in voltage, to the extent that if the track voltage falls to 40 per cent, the circuit breaker will trip on zero current. This feature is of value in making the cir-

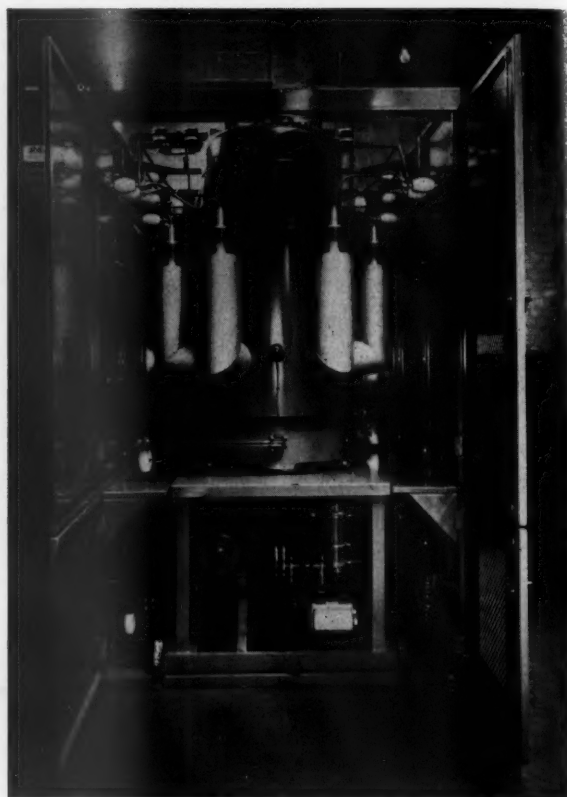
cuit breaker more sensitive to track faults. A 110-V. switch closing and tripping battery with combined metal rectifier trickle and quick charging equipment, and a 50-V. battery with similar charging for operation of the supervisory control is supplied by Chloride Batteries Limited. On the Central Section, the contractor for the H.V. switchgear is the General Electric Co. Ltd., supplying the same type of switchgear as on the Western Section. The firm is also supplying the transformers and rectifiers. The rectifiers are of the six-anode pumpless, air-cooled steel cylinder type, four cylinders forming a 2,500-kW. set and arranged in two twin cubicle assemblies, each twin cubicle forming a 12-phase assembly. The d.c. switchgear in both substations and track paralleling huts is supplied by the British Thomson-Houston Co. Ltd., and consists of truck-mounted high-speed circuit breakers of its "RJR" type. In this case a pair of high-speed circuit breakers in parallel is arranged to form the rectifier circuit breaker, and,

central gangway, each pair being a 12-phase assembly. The d.c. switchgear in substations and track paralleling huts is supplied by the British Thomson-Houston Co. Ltd.; the battery equipments are by Pritchett & Gold and E.P.S. Co. Ltd., and are similar to those for the other two sections.

Supervisory Remote Control

The supervisory remote control is being supplied by the General Electric Co. Ltd., and has been specially adapted to give very rapid operation and indication, rendered necessary by the large number of rectifier and feeder equipments controlled from each control station. There will be three control stations, placed at Raynes Park, Selhurst, and Lewisham, and these areas of control have been made to agree closely with the railway operating areas on the Western, Central and Eastern Sections so far as these come within the boundaries of the conversion scheme.

Twenty-eight substations will be controlled from Raynes Park, 17 from Selhurst, and 26 from Lewisham, in addition to which 33-kV. switching



(Left) Partial view of Eastern Section substation interior showing English Electric rectifier cubicles; (right) Internal view of G.E.C. rectifier cubicle

stations, supply points and track paralleling huts will come in the area of each. Certain substations have their

equipment divided between two control stations so that a method of alternative control from either of two con-

trol stations is used for certain important substations which are situated within the inner area.

SECOND BRITISH RAILWAYS CLYDE CAR FERRY IN SERVICE.—M.V. *Cowal*, the passenger-car ferry, launched at Troon by the Ailsa Shipbuilding Co. Ltd. on January 20, and the second British Railways vessel of her kind to service the Clyde, recently replaced the *Arran* on the Gourock-Dunoon service. Similar in every way to the *Arran*, the *Cowal* is a twin-screw ship, equipped with radar, has a tonnage of 568, and can carry up to 650 passengers besides cargo and road vehicles. Her main propelling machinery has been supplied by British Polar Engines Limited. A third vessel of the *Arran* type meantime is being built at the Troon Shipyard for British Railways Clyde services.

SURVEY OF CANALS AND INLAND WATERWAYS.—The British Transport Commission announces that in accordance with the statement recently made to Parliament by Mr. Alan Lennox-Boyd, Minister of Transport & Civil Aviation, a survey is to be undertaken of the Commission's waterways, and a report made to the Chairman of the Commission on whether all possible steps are being taken to ensure that the maximum economic advantage is being derived from the canal system under the Commission's control; and on the steps to be taken as regards such of these waterways as can no longer be put to economic

commercial use. The Chairman of the Commission, Sir Brian Robertson, appointed Lord Rusholme as the B.T.C. representative, and the Minister of Transport has now approved Sir Brian Robertson's appointment of Sir Rex Hodges and Mr. R. D. Brown as independent members forming a small board of survey with Lord Rusholme as chairman.

SOCIETY OF ENGINEERS CENTENARY CELEBRATIONS.—The Society of Engineers is celebrating its centenary from Tuesday, May 4 to Thursday, May 6. The Society was founded in London in 1854 as the Putney Club and became the Society of Engineers in 1857. In 1910 it was amalgamated with the Civil & Mechanical Engineers' Society, which had been formed in 1859, and since then it has been known as the Society of Engineers (Incorporated). It is claimed to be the third oldest engineering society in Britain. The President-Elect for the centenary year is Mr. W. R. Howard. The Centenary Committee is organising a comprehensive programme of events, and the celebrations will open on May 4 with a conversazione at the Science Museum, South Kensington. Scottish members will hold their own centenary celebrations on May 15, with a banquet at the headquarters of the Royal Society of Edinburgh. The Society's members are strong in Australia

and separate celebrations will be held there. The Australian Divisional President is Sir Henry Barraclough.

BRUSSELS AIRPORT RAILWAY LINK.—At the official opening of the new terminal of Sabena, the Belgian air line, near the new central station in Brussels, Monsieur Périer, Chairman of Sabena, announced that the terminal would soon be linked by railway with Melsbroek airport. Melsbroek is to become the only Belgian airport for international traffic, and the principal Belgian cities will be connected with it by helicopter services.

BRITISH RAILWAYS, WESTERN REGION, FIRST AID MOVEMENT.—Mr. T. W. Geden, Stationmaster, Paddington, presided at the recent presentation of first-aid awards to members of the London "A" District of the Western Region. He was supported by Mr. K. W. C. Grand, Chief Regional Manager, who presented the trophies and prizes gained in the District competitions, and also a number of long service efficiency awards. The presentation of class awards was made by Mr. N. H. Briant, District Operating Superintendent, Paddington. Other officers present included Mr. Gilbert Matthews, Operating Superintendent; Mr. A. C. B. Pickford, Commercial Superintendent; and Mr. M. G. R. Smith, Civil Engineer, Western Region.

Southern Region Change of Frequency Scheme—2



B.T.H. 33-kV switchgear in Lewisham switching station



Bertram Thomas d.c. switchgear in Queens Road substation

Oil-Burning Locomotives for Iraq

*Metre-gauge "YD" class engines
of 22,110 lb. tractive effort*

TEN new oil-burning 2-8-2 type locomotives built by the Vulcan Foundry Limited for the Iraqi State Railways have recently been placed in service on the Baghdad-Basra section. The engines, which were built to the inspection of the Crown Agents for Oversea Governments & Administrations have a tractive effort of 22,110 lb. at 85 per cent boiler pressure and weigh 96.66 tons in working order.

Design Features

The boiler and firebox are of the Bel-paire type with a steel inner firebox of riveted construction with rigid and flexible stays of Longstrand steel. A slide valve regulator is fitted in the dome, and the superheater is of the Melesco pattern. The cylinders are of cast iron and are fitted with cast-iron barrel liners. Walschaerts valve gear actuate 8-in. dia. piston valves. Brittalic Metallic packing is fitted to the piston rods. The connecting rod little ends are oil lubricated, while the big ends

and coupling rod bearings and coupled wheel axleboxes are arranged for hard grease lubrication.

The front and hind trucks are fitted with British Timken roller bearings, the former having the cannon type, while the hind truck roller bearings are of the outside double-roller type. Fittings include two Gresham & Craven No. 9 injectors, fitted one on each side under the cab platform delivering boiler feed water through top clackboxes. Other fittings include two 2½-in. Ross pop safety valves, two Dewrance type water gauges, two 1½ in. Everit blow-off cocks, and a Wakefield A.C. type 2-feed, S.F. lubricator of three-pint capacity.

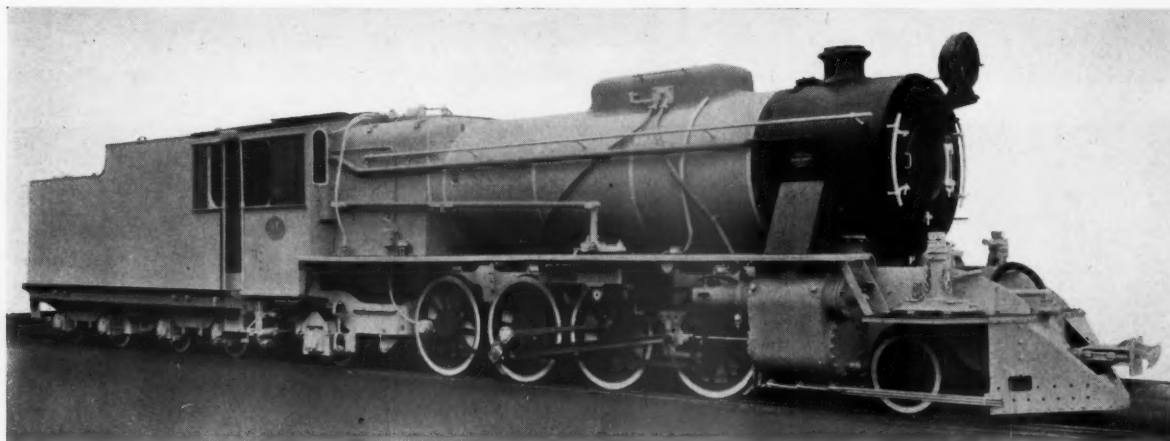
Tender Particulars

The tender water tank is fitted with welded and riveted stays and has two filling holes with strainers located one on each side at the hind end. The oil fuel tank has a capacity of 1,650 gallons, and fits in the bunker space. The oil tank is easily removable if at any

time it is decided to change over to coal burning. The tender water tank has a capacity of 3,000 gallons. The tender bogies are of the plate frame type and are fitted with British Timken roller bearings identical with those on the engine trailing truck.

The principal dimensions are as follow:—

Cylinders (2)	...	17 in. dia. × 24 in. stroke
Truck wheels, dia.	...	2 ft. 4½ in.
Coupled wheels, dia.	...	4 ft.
Wheelbase, coupled	...	13 ft. 5 in.
Wheelbase, total engine	...	27 ft. 9 in.
Heating surface:		
Flue tubes (21)	...	434 sq. ft.
Boiler tubes (92)	...	814 sq. ft.
Firebox	...	133 sq. ft.
Total	...	1,381 sq. ft.
Superheater	...	285 sq. ft.
Grate area	...	26 sq. ft.
Boiler pressure	...	180 lb. per sq. in.
Tractive effort at 85 per cent boiler pressure	...	22,110 lb.
Adhesive weight	...	38.82 tons
Adhesive factor	...	3.94
Engine in working order	...	56.33 tons
Tender water capacity	...	3,000 gal.
Tender oil fuel capacity	...	1,650 gal.
Tender wheelbase	...	16 ft.
Tender in working order	...	40.32 tons
Total engine and tender in working order	...	96.66 tons



Iraqi State Railways oil-burning goods locomotive supplied by the Vulcan Foundry Limited

C.A.V. EXHIBITS AT THE B.I.F.—The C.A.V. exhibits at the forthcoming British Industries Fair, will include a comprehensive range of fuel injection and electrical equipment for commercial and passenger vehicles, industrial, and marine engines. Included in the fuel injection equipment are sectional models of pumps with mechanical, hydraulic, and pneumatic governors. The pumps are built in sizes suitable for engines up to 500 b.h.p. per cylinder. Flange mounted (without camshaft) and enclosed camshaft types are exhibited. An addition to the multi-cylinder enclosed camshaft type pumps is the AA series, exemplified by a 6-cylinder unit, equipped with mechanical governor; pneumatic governors can also be supplied. Electrical exhibits will include C.A.V. generators and engine starters, the latter

including a new model, type SO45, designed for use with oil engines of medium size. Other exhibits will include a selection of control boards, lead-acid, and alkaline type batteries, direction indicators, and other equipment.

UNITED STEEL COMPANIES' CAMBRIDGE SCHOLARSHIPS.—The United Steel Companies Limited have endowed an entrance scholarship, tenable at St. John's College, Cambridge, open to candidates who intend to study physical or mechanical sciences. It will be offered annually at the open examination for entrance scholarships and exhibitions of the college; the emolument will be £100 a year, but the college will be entitled to augment this to a total of £150. No stipulation is made as to the future career of the scholars, though it is

hoped that for some of them there may emerge a common wish to make their careers with the company.

BRITISH EUROPEAN AIRWAYS DEFICIT.—Lord Douglas of Kirtleside, Chairman of British European Airways, has said that the corporation's deficit for the financial year 1953-54 would be a little larger than in the previous year, when it was some £1,400,000. They hoped to be able to reduce their deficit by some 32 per cent in the current financial year. Operation of uneconomic internal services, low rates for mail carriage, the petrol tax, and the cost of introducing new aircraft, including £1,000,000 to bring the Viscount into service, are given as reasons for last year's deficit.

RAILWAY NEWS SECTION

PERSONAL

TOTHILL PRESS LIMITED

Mr. George Rollason, Deputy Chairman & Managing Director of Tothill Press, Limited, the company which owns and publishes this journal and with which he has been associated for over 40 years, is, at his own request, relinquishing the office of Managing Director. He will remain on the Board as Deputy Chairman and his long experience in publishing will continue to be at the disposal of the company.

Mr. B. W. C. Cooke, and Mr. R. H. Gosling have been appointed Joint Managing Directors. Both have been associated with the company for many years. Mr. Cooke as Editorial Director and Editor of *The Railway Gazette*, and Mr. Gosling as Director & Secretary. Mr. Cooke will remain Editor of this journal.

Mr. J. H. Fraser, O.B.E., Chief Officer (Signal & Telecommunications), British Transport Commission, has been elected President of the Institution of Railway Signal Engineers. Mr. Fraser has been Vice-President of the Institution during the past year.

Mr. D. M. Robbertze, Assistant General Manager, Commercial (South African Railways), has been appointed Deputy General Manager. He takes office on January 1, 1955, when Mr. D. P. McDonald retires.

Mr. W. I. Winchester, Assistant Director of Budgets, British Transport Commission, has been appointed a Director of the East Kent Road Car Co. Ltd.

Mr. J. T. Moore, Chief Engineer of the English Electric Co., Ltd., is relinquishing his present position to take up a directorship with Ewbank & Partners Limited, Consulting Engineers.

Mr. E. McClelland, M.Inst.T., Assistant District Operating Superintendent, Sunderland, North Eastern Region, British Railways, has been appointed Assistant District Operating Superintendent, Darlington.

Mr. D. Fenton, Assistant District Operating Superintendent, Nottingham, Eastern Region, British Railways, has been appointed District Operating Superintendent, Southend District, Fenchurch Street, in succession to Mr. W. O. Reynolds, with effect from March 29.

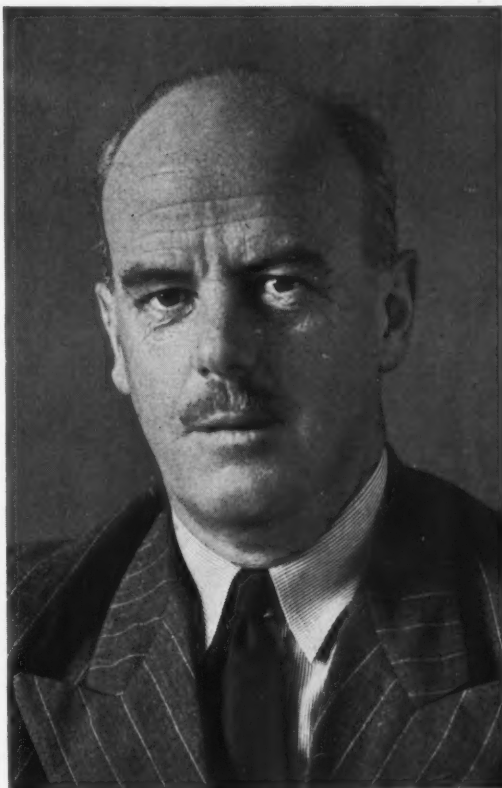
INSTITUTE OF TRANSPORT.

Colonel F. C. Horner, Honorary Corresponding Member of the Institute, U.S.A., has retired. He has been succeeded by Professor G. Lloyd Wilson.

Mr. Faïd Ahmed has been appointed the first Honorary Corresponding Member for Pakistan.

The death of Sir John Sanders has left Malaya for the time being without an official representative.

Mr. W. Urquhart, O.B.E., B.Sc., M.I.C.E., Chief Engineer, East African Railways & Harbours, who, as recorded in our April 9 issue, has been appointed Deputy General Manager, was educated at Edinburgh Academy and Edinburgh University. He served his early engineering training with Sir W. G. Armstrong Whitworth & Co. Ltd., and was employed as an Assistant Engineer on construction works in England and Newfoundland. In Jan-



Mr. W. Urquhart

Appointed Deputy General Manager,
East African Railways & Harbours

uary, 1926, Mr. Urquhart joined the Uganda Railway as Assistant Engineer and, in 1933, he became Engineer-in-Charge at Mombasa Port. After three years there he worked in both headquarters and various districts, being promoted to District Engineer in 1942 and becoming a Senior District Engineer in 1943. He filled the post of New Works Engineer in headquarters from this date until his promotion to Assistant Chief Engineer in 1946, and he retained the post on the amalgamation of the Kenya & Uganda and Tanganyika railways in 1948. He acted as Chief Engineer for lengthy periods from 1946 until his appointment as Chief Engineer, East African Railways & Harbours in April, 1952. Mr. Urquhart was President of the East African Association of Engineers in 1948 and 1949. He was awarded the Order of the British Empire in the 1946 New Year's Honours List.

Mr. G. W. Parkin, who has been confirmed in the position of Assistant (Electric

Traction & Generation) Mechanical & Electrical Engineer's Department, Derby, London Midland Region, British Railways, began his career on the former Mersey Railway at Birkenhead Central as a junior engineer in 1922. After training and holding various posts he became Assistant to Operating Engineer and later Engineer's Assistant. Mr. Parkin was appointed Engineering Superintendent in 1928 and continued in this position following the takeover of the Mersey Railway by the London Midland in 1951 until December, 1953, when he became Acting Assistant (Electric Traction & Generation), Mechanical & Electrical Engineer's Department, Derby. Mr. Parkin is a Master of Engineering (Liverpool University) and an Associate Member of the Institution of Electrical Engineers.

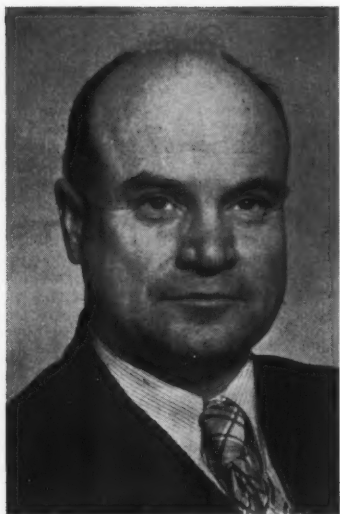
Mr. Andrew Black, Director of Acquisitions of the British Transport Commission, has been appointed a director of Trent Motor Traction Co. Ltd. He fills the vacancy caused by the resignation of Sir Reginald H. Wilson, who is a member of the Commission.

Colonel F. J. J. Prior, O.B.E., M.I.C.E., has been appointed Commander, 19th Railway Group R.E., A.E.R., in succession to Colonel B. M. Strouts, M.B.E. He previously held the appointment of C.O., 136 Const. Regt. R.E., and also served during the 1939-45 war as Lieutenant-Colonel, Railway Construction Engineer, No. 5 (Indian) C. & M. Group, and as the Assistant Director of Transportation, Assam, responsible for all railway construction on the Assam Line of communication for the maintenance of the 14th Army and U.S. Forces in C.B.I.

His civil appointment is that of District Engineer, British Railways, Southern Region, Purley.

Mr. P. H. Dunn, Engineering Assistant of the Civil Engineer's Office, Waterloo, has been appointed Assistant (Works Design), Civil Engineering Department, Waterloo, with effect from March 22.

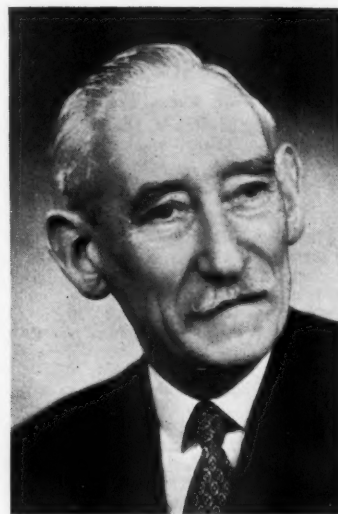
Mr. Ronald E. B. Lee, Comptroller of Accounts and Audit of the Western Australian Government Railways, who, as recorded in our April 2 issue, has been appointed Assistant Commissioner (Commercial) on the Western Australian Government Railways Commission, has, for 28 years, been engaged in important posts for the railways of both Victoria and Western Australia. From 1926 to 1935 he was a Special Officer as Investigating Accountant to the Chairman of the Victorian Railways Commissioners, the late Sir Harold Clapp, K.B.E. An article by Mr. Lee dealing with the mechanisation of office accounts at Melbourne Goods Depot was published in the October 14, 1932, issue of *The Railway Gazette* and attracted considerable attention. Mr. Lee was responsible for the introduction of job cost-

**Mr. R. E. B. Lee**

Appointed Assistant Commissioner (Commercial),
Western Australian Government Railways

**Mr. L. W. Conibear**

Executive Officer (Passenger) Railway Executive,
1948-54

**Mr. P. C. Durrant**

General Agent of British Railways in France,
1950-54

ing at the Newport Workshops, and much success attended the preparation of costs for labour, materials and overhead using electric tabulating machines. He has had extensive experience in Australian railway accounting practice, investigations and re-organisation. For three years he made intensive studies of railway methods and organisation in the U.S.A. with the Southern Pacific Lines, the Chesapeake & Ohio Railway and the New York Central Railroad. From 1935 to 1948 he was Auditor of Revenue for the Victorian Railways, and, in April, 1948, was appointed Comptroller of Accounts & Audit of the Western Australian Government Railways. Mr. Lee is a Bachelor of Commerce, a Bachelor of Laws, a qualified accountant and licensed auditor, a Fellow of the Royal Statistical Society, London, and a member of the National Association of Cost Accountants, New York. He was on

active service in France and Belgium with the 7th Battalion, First A.I.F. Between the wars he became Staff Captain on Headquarters 15th Infantry Brigade, and was Deputy Assistant Quartermaster General, 3rd Division, Australian Forces, in the early part of the 1939-45 war.

Mr. L. W. Conibear, formerly Executive Officer (Passenger), Railway Executive, who retired on March 6, entered the service of the Great Western Railway in 1905, when he was attached to the Telegraph Department, Bristol. He was transferred in the next year to the Traffic Department at Stapleton Road Station. In 1907, he went to the Divisional Superintendent's Office, Bristol, and was engaged there on various duties until he joined the army in January, 1917; he served with the Royal Engineers (Light Railway) in France and Belgium. Mr. Conibear returned to

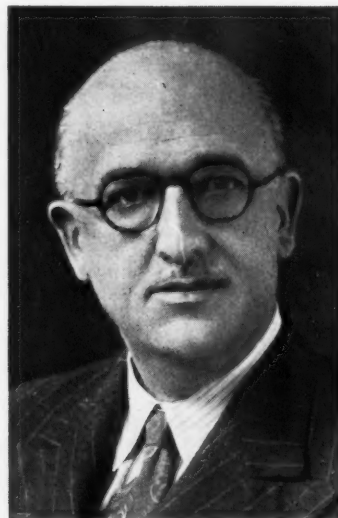
the Divisional Superintendent's Office at Bristol towards the end of 1919, and gained experience in the Passenger Train Section. In 1936 he was transferred to Paddington to the Office of the Superintendent of the Line in the Excursion Department, and was promoted in charge of that section in 1938. In 1941 Mr. Conibear was appointed Assistant Divisional Superintendent at Bristol; and he returned to Paddington as Acting Chief Clerk to the Superintendent of the Line in February, 1945. In May of the same year he became Commercial Assistant to the Superintendent of the Line. He was appointed Executive Officer (Passenger), Railway Executive, in 1948. He has been associated with the R.C.H. Coaching Superintendents' Conference, and Continental Traffic Managers' and R.E.C. Passenger Committees. Mr. Conibear was the recipient of a presentation from senior officers at the British Transport Commis-

**Captain F. C. Raven**

District Marine Manager & Harbourmaster,
Heysham, 1946-1954

**Captain A. E. Willmott**

Appointed District Marine Manager &
Harbourmaster, Heysham

**Mr. M. F. Barnard**

Elected President for 1954-55,
Mansion House Association on Transport

sion Headquarters. The presentation was made on behalf of the subscribers by Mr. V. Radford, Chief Financial Officer, British Transport Commission.

Mr. P. C. Durrant, General Agent of British Railways for France, who, as recorded in our April 9 issue, retired on March 31 after 48 years service, joined the L.N.W.R. in 1906 as an assistant to its Goods & Passenger Agent in Paris. At the outbreak of the 1914-18 war he transferred to Euston and then to Shoreditch, where, between 1915 and 1919, he was attached to the Salvage Department, from time to time giving assistance in connection with ambulance trains being built for use in France. He returned to the L.N.W.R. Paris office and, when the main line companies were formed in 1923 he was appointed Assistant Agent in the L.M.S.R. Paris Office, becoming Agent in 1934. In 1936 a joint railway office was opened in Paris and Mr. Durrant became Assistant General Agent for France. He maintained this position until June, 1940, when, finding himself unable to reach England, he joined the Commercial Department of the Eastern Region of the French Railways. After the liberation of Paris he joined the American Red Cross and was appointed Director of its "Ranger" services and was responsible for opening and maintaining canteens and rest rooms at airports and railway stations in and around Paris. When the New-haven-Dieppe service was recommenced in 1945, Mr. Durrant opened a temporary office in the St. Lazare station, Paris, and, in 1950, was appointed General Agent for France. In 1953 he received from the French Government the honour of "Chevalier de la Legion D'Honneur," in addition to which Mr. Durrant also holds the "Medaille d'Honneur" and is an Officer of the Order of the Star of Rumania.

Captain Frederick Charles Raven, M.B.E., District Manager & Harbourmaster at Heysham, London Midland Region, British Railways, who, as recorded in our March 12 issue, retired last month, joined the Marine Department of the Midland Railway as a Second Officer at Heysham on the day he was demobilised from the Royal Navy in March, 1919. In 1924 he was promoted Chief Officer, and, in 1930 he became Temporary Master, being confirmed as Master s.s. *Duke of Rothesay* in 1931. Captain Raven has, during his career, been in command of every London Midland ship based at Heysham. At the outbreak of the 1939-45 war he transported troops to France in the *Duke of Rothesay* and, in 1942, he received the M.B.E. for service in the Merchant Navy. In 1944 he went to Northern Ireland as temporary Marine Superintendent & Liaison Officer at Larne Harbour, returning in 1946 to Heysham as Marine Superintendent & Harbourmaster. The same year he was appointed Sub-Commissioner of Trinity House, Morecambe Bay Area.

Captain A. E. Willmott, who, as recorded in our March 12 issue, has been appointed District Marine Manager & Harbourmaster, Heysham, London, Midland Region, British Railways, entered the railway service at Goole in 1927 as Second Officer. He first went to Heysham in 1934, being promoted Chief Officer in 1936 and Master in 1946. Captain Willmott served with the Royal Navy during the last war and was awarded the D.S.C., the Netherlands Order of Orange Nassau and was three times mentioned in despatches.

Mr. M. F. Barnard, M.Inst.T., who, as announced in our April 2 issue, has been appointed President of the Mansion House Association on Transport, in succession to Sir Alfred Faulkner, C.B., C.B.E., M.Inst.T., still retains the office of Chairman of the Council of this body. Mr. Barnard received his early training in the Chief Goods Manager's Department of the former London & North Western Railway. He served as a subaltern in the Surrey Yeomanry during the 1914-18 war, and returned to Euston in 1919. A year later he accepted the post of Transport Officer to what has since become the British Iron & Steel Federation. In this capacity he has been responsible, before the Railway Rates Tribunal, for all questions of rates and charges affecting the iron and steel industry, and has frequently given evidence before that body. He has also had the unique experience of protecting his industry's interests during the consideration of the three Bills which became the Railways Act 1921 and the Transport Acts of 1947 and 1953. In 1932, while continuing as Transport Officer, he assumed the duties of Assistant Secretary of the Federation, relinquishing that office in 1936 to take over the secretaryship of the Basic Pig Iron Producers' Association. A year later, he became Secretary of the International Scrap Convention and of the International Shipbreakers' Association, posts involving considerable continental travel. At the outbreak of war in 1939, the staff of the Federation formed the nucleus of the Iron & Steel Control of the Ministry of Supply. Mr. Barnard was appointed Establishment Officer, and in that capacity was responsible at short notice for evacuating in a matter of hours a large staff and office equipment to new quarters a hundred miles out of London, and for their care and needs until the termination of hostilities. After the war, he returned to London and assumed his previous responsibilities as Transport Officer, with the additional duties of Administration & Establishment Officer. He is a Member of the Council of the Institute of Transport; Chairman of the Traders' Co-ordinating Committee on Transport (a body of 96 National Trade Associations); Chairman of the Rail Panel of the F.B.I. Transport Policy Users' Committee; Vice-Chairman of the Traders' Dock & Harbour Co-ordinating Committee and a Member of the Council of the Traders' Traffic Conference. Mr. Barnard is also Councillor for the Borough of Ealing, and is Chairman of its Highways Committee and Safety First Council. In his spare time he is a keen horticulturalist and has won the cup for the best garden in his local Horticultural Society's competition on more than one occasion.

The following staff changes are announced by London Midland Region, British Railways:—

Mr. J. G. Handley, Stationmaster, Kirkcaldy, Scottish Region, to be Stationmaster, Manchester Central.

Mr. J. H. Buck, Clerk-in-Charge, Birmingham, Moor Street, to be Goods Agent, Camp Hill.

Mr. A. Cussons, Stationmaster, Dereham, Eastern Region, to be Stationmaster, Burton-on-Trent (i/c Horninglow).

Mr. J. W. Cochrane, Chief Clerk, Birkenhead, Cathcart Street, to be Goods Agent, Langton Dock, North Mersey.

Mr. B. Grazier, Chief Clerk, Derby St. Mary's, to be Goods Agent, Oldbury.

Mr. R. A. Sharp, Goods Agent, Victoria & Albert, Western Region, to be Goods Agent, Poplar (also i/c Canning Town & Victoria Dock).

Mr. Harold F. Farmer, who for almost forty-eight years has been closely associated with the design and production of electrical control gear, retired from the British Thomson-Houston Co. Ltd. on April 9.

Metropolitan-Vickers Electrical Co. Ltd., announces that Mr. S. McCracken, A.M.C.T., M.I.E.E., previously Manager of the Belfast sub-office, was appointed a Director of Metropolitan-Vickers South Africa (Pty.) Ltd. on April 1. Mr. McCracken sailed for South Africa on March 25.

Mr. R. Needham has resigned from the board of G. D. Peters & Co. Ltd. as from March 15, 1954.

Mr. J. E. Blackshaw, M.B.E., has retired as Managing Director of the company but retains his seat on the board.

Mr. Henry Jackson Stretton has been appointed General Manager and a Director of the company and its subsidiaries as from April 1, 1954.

TRANSPORT USERS CONSULTATIVE COMMITTEE

(EAST ANGLIA AREA)

The first term of office of the Transport Users Consultative Committee for East Anglia having expired on March 31, 1954, the Minister of Transport & Civil Aviation has appointed the undermentioned persons to be members of the Committee for the East Anglia Area until March 31, 1957:—

Chairman: Captain W. H. Coombs, C.B.E., R.N.R.

Members: (Representing Agriculture) Messrs. T. Black, W. Inskip, A. L. Fawkes. (Representing Industry) Messrs. A. C. Maton, L. A. Carey, M.Inst.T. (Representing Commerce) Mrs. B. E. Double, J.P. (Representing Shipping) Mr. M. O. Gill, F.I.C.S. (Representing Labour) Messrs. E. J. Harding, W. J. Bird. (Representing Local Authorities) Alderman E. N. Selby, J.P. (Representing the British Transport Commission) Messrs. C. G. G. Dandridge, C. H. S. Pickett.

Secretary: Mr. F. E. Tyler.

Three further members representing Local Authorities and one representing Commerce have yet to be appointed.

The office of the Committee is at Station Road, Cambridge.

HOLIDAYS IN BRITAIN EXHIBITION.—The many pleasant kinds of holiday which Londoners can enjoy in this country and the attractions of British resorts are featured in the exhibition now being held at Charing Cross Underground Station, which closes on April 30; it has been organised by the British Travel & Holidays Association. There are three main sections: "When to take it," "What to make it," and "Where to take it." The "When to take it" section publicises the advantages of holidays in June and September; the "What to make it" displays the various kinds of holiday that can be taken; and for the "Where to take it" section, Britain is divided into geographical areas, with large pictures for each area and a series of smaller pictures featuring the leading resorts in the area. There is also a large map of the British Isles showing all the holiday resorts, with a key giving the special characteristics and amenities each place possesses. Smaller displays deal with such subjects as travel facilities and the work of the Holidays Association. The exhibition may be staged later in some of the provincial centres.

Mechanically Refrigerated Van for Interfrigo

Axle-driven plant in prototype vehicle

A prototype van equipped with mechanical refrigeration powered from the axle was inspected at Liverpool Street Station on April 9 after touring British Railways and before leaving for Belgium to be exhibited at the Liège International Fair. The refrigeration system is supplied by J. Stone & Co. (Deptford) Ltd., which has had long experience with Stone-Carrier air-conditioning for passenger coaches. The van has been converted from a standard type of refrigerated van built by Schindler Waggon A.G. of Pratteln, Switzerland, for Interfrigo (Société Ferroviaire Internationale de Transports Frigorifiques), which operates a large fleet of such vans for carrying perishables between Continental countries and from the Continent to this country.

Fully-Automatic Unit

The aim has been to produce a fully-automatic unit which can operate without attention in transit. When the van is running the refrigerating compressor is driven by the axles, and when stationary by an a.c. motor fed from the external mains supply. The cooler unit is the only item of the equipment which takes up any of the loading space within the van and that only a small part, at one end, leaving a loading area of 1,271 cu. ft. available.

At a luncheon given at the Great Eastern Hotel, Mr. K. H. Preston, Chairman, J. Stone & Co. (Holdings) Ltd., welcomed the visitors and introduced Mr. A. H. Chilton, Chairman, J. Stone & Co. (Deptford) Ltd. Mr. Chilton explained the advantages of the new equipment and expressed his thanks to British Railways for the facilities which they had given. Those present included:—

Messrs. L. Alexander, Metropolitan-Cammell Carriage & Wagon Co. Ltd.; R. C. Atkinson, United Africa Co. Ltd.; H. C. Barton, Chief Traction Engineer, Messrs. Merz & McLellan; H. Bennett, Commercial Manager, Engineering Division, J. Stone & Co. (Deptford) Ltd.; J. K. Bridcut, Sales Department, J. Stone & Co. (Deptford) Ltd.; R. C. Bond, Chief Officer, (Mechanical Engineering), British Transport Commission; H. J. Bourn, Assistant Continental Superintendent, British Railways, Southern Region, and representing Societe Interfrigo; A. J. S. Brown, Managing Director, J. Stone & Co. (Deptford) Ltd.; A. Campbell, Chief Mechanical Engineer, Crown Agents for Oversea Governments & Administrations; E. C. Chapman, Chief Engineer, J. Stone & Co. (Deptford) Ltd.; R. Chapman, Assistant Chief Inspecting Engineer, Egyptian Government, London; S. A. Chisholm, New Zealand Meat Board; G. Coaker, Goods Canvassing Assistant to Commercial Superintendent, British Railways, Eastern Region; B. W. C. Cooke, Editor, *The Railway Gazette*; S. E. Coppen, Senior Mechanical Engineer, Crown Agents for Oversea Governments & Administrations.

Messrs. R. Da Costa, Railway Adviser to High Commissioner, Indian Government, London; C. G. G. Dandridge, Commercial Superintendent, British Railways, Eastern Region; W. H. Dixon, Personal Assistant to Sales Director, J. Stone & Co. (Deptford) Ltd.; E. J. Fawcett, Director General, Agriculture, New Zealand; C. A. Gammon, Assistant (Wagon Design), Carriage & Wagon Engineering Department, British Transport Commission; R. Garnham, Charterhouse Cold Storage Co. Ltd.; G. Gibson, Chief Mechanical Engineer, East African Railways & Harbours; T. O. M. Halliday, Chief Estimator, Gloucester Railway

Carriage & Wagon Co. Ltd.; N. Henderson, Messrs. Livesey & Henderson; G. F. Huskisson, Assistant to Commercial Superintendent, British Railways, Eastern Region; C. Ingoldby, Messrs. Rendel, Palmer & Tritton; A. N. Jackson, Director, J. Stone & Co. (Deptford), Ltd.; D. E. James, Managing Director, J. Stone & Co. (India) Ltd.; E. Kent, Managing Director, Stone - Wallwork Limited; B. J. King, representing Agent - General for Queensland; The Hon. Sir John Lienhop, Agent-General for Victoria.

Mr. W. H. Maass, Advisory Engineer, South African Railways, London; Sir Alexander McColl, Chairman, Superheater Co. Ltd.; Messrs. A. B. MacLeod, Stores Superintendent, London Midland Region; P. Middlemas, Director, Birmingham Railway Carriage & Wagon Co. Ltd.; O. S. Naylor, London Agent, Rhodesia Railways; L. H. K. Neil, Continental Traffic Manager, British Railways, Eastern & North Eastern Regions, and representing Societe Interfrigo; J. J. C. Paterson, Messrs. Rendel, Palmer & Tritton; P. A. Peterson, Director, J. Stone & Co. (Deptford) Ltd.; F. A. Pope, Member, British Transport Commission; F. A. G. Powell-Jones, Director, J. Stone & Co. (Holdings) Ltd.; K. B. Rao, Director-General, India Stores Department; L. Reeves, Acting Carriage & Wagon Engineer, British Railways, Eastern & North Eastern Regions; E. A. Robinson, Managing Director, Superheater Co. Ltd.; A. E. Robson, Acting Chief Officer (Carriage & Wagon Construction & Maintenance), British Transport Commission; S. Russell, Carriage & Wagon Works Manager, Stratford, British Railways, Eastern Region; W. J. Ruston, Sales Director, J. Stone & Co. (Deptford) Ltd.

Messrs. L. Sheriff, New Zealand Meat Board; E. Steiner, Schindler Waggon A.G.; F. Stickland, Research & Development Engineer, J. Stone & Co. (Deptford) Ltd.; W. B. G. Swayne, Sudan Government, London; Group Captain P. G. Thomson, Director, J. Stone & Co. (Deptford) Ltd.; The Hon. J. M. Tully, Agent-General for New South Wales; Messrs. S. B. Warder, Chief Officer, Electrical Engineering, British Transport Commission; A. J. White, Assistant Chief Regional Officer, British Railways, Eastern Region; Sir Bruce White, Sir Bruce White, Wolfe Barry & Partners; Mr. J. Vidal, Director, J. Stone & Co. (Deptford) Ltd.

Locomotive Engineers Visit to B.T.H. Rugby Works

Over 200 members of the Institution of Locomotive Engineers visited the works of the British Thomson-Houston Co. Ltd. at Rugby on April 8. The majority of the visitors travelled from London by special train.

The programme included visits to the turbine factory, heavy plant factory, fabrication department, and lamp works. A special demonstration of industrial electronic equipment also was arranged. Exhibits, many of which were shown working, ranged from photo-electric relays and high-speed electronic counting equipment to larger items such as electronic motor control panels and resistance welding machine control cubicles.

Three diesel-electric locomotives with B.T.H. electrical equipment were available for detailed examination. These included one of the 18 400-h.p. locomotives with mechanical parts by the Clayton Equipment Co. Ltd., and diesel engine by Davey, Paxman & Co. Ltd., which are being sup-

plied to the Western Australian Government Railways for shunting and light passenger train duty, a 275-h.p. steelworks shunting locomotive built by the Yorkshire Engine Co. Ltd. with Davey, Paxman engine, and a 150-h.p. Ruston-B.T.H. standard works shunter which had completed four years service at the Rugby works. The steelworks shunter was fitted with B.T.H. carrier frequency communication equipment as developed for British Railways. The signal is fed into the track network and picked up by an aerial underneath the locomotive.

The party was welcomed by Mr. K. R. Hopkirk, Director & Chief Mechanical Engineer of the British Thomson-Houston Co. Ltd., who said that the visitors, as locomotive engineers, no doubt had found what they had seen of particular interest.

Gas Turbine

The company, he added, had contributed to locomotive development in the past, and would go on doing so but its primary interest lay in electric traction. They had not yet entered the gas-turbine field as they felt that this form of power was not yet sufficiently reliable to meet railway demands.

Mr. J. F. B. Vidal, Vice-President of the Institution, replied on behalf of the visitors and emphasised that the Institution was a comprehensive body interested in all forms of traction.

Associated Electrical Industries Limited

The annual meeting of Associated Electrical Industries Limited was held in London on March 31. Sir George Bailey, the Chairman, said in the course of his speech that the company had again established a record rate of production in 1953.

A matter which warranted special attention was the repatriation of about 25 per cent of the ordinary stock of the company which the International General Electric Company considered it necessary to dispose of under American law. It was reassuring, he added, that Morgan Grenfell & Co. Ltd. had undertaken to finance the repatriation of these shares and that they would not fall into foreign hands.

Between 1946 and 1953 the A.E.I. group had spent some £16,000,000 in buildings and plant. The increased physical output of the group resulted in profits, before taxation, of some £10,740,000 compared with £9,900,000 the year before.

Sir George Bailey welcomed the end of the excess profits levy. There was no relief from this in the year under review and the penal effect of taxation had largely nullified improved performance. The board considered it prudent to recommend an increase in distribution to stockholders as a bonus on the ordinary shares. The proposal represented a total distribution of 11½ per cent on the ordinary stock or 22½ per cent on the stock before the recent scrip issue.

Railway Rolling Stock Orders

An order received by Metropolitan-Vickers Traction Department during the year provided an interesting link with the past. Traction motors and control gear totalling more than £250,000 had been ordered for modern motor coach saloon rolling stock for the Merseyside railways. Metropolitan-Vickers, then the British Westinghouse Company, had secured its first electric traction contract in July 1901 for the same line, and ten motor coaches were still in service fitted with the

original equipment. British Railways had also ordered 15 diesel-electric power units for shunting locomotives from the British Thomson-Houston Co. Ltd. and that company had supplied 12 further equipments for diesel electric locomotives for steel works.

Total orders received during the year showed a reduction on 1952 and, with the increase in production, had led to a reduction of the volume of orders in hand. These amounted, Sir George Bailey said, to a comforting total of £124,000,000 with deliveries extending into 1957.

Foreign Competition

It was not sufficiently appreciated, he continued, that since the war they had moved from a position of having no competition from German and Japanese manufacturers to one where those countries were increasing their engineering exports at a rapid rate and had rebuilt their factories on modern lines and with first-class tools and equipment; they were also prepared to accept orders at extremely low prices, short deliveries, and very favourable terms of payment, including long-extended credits. In some cases a complicated system employing several currencies or even barter had been used. The board viewed the future with sufficient optimism to undertake further long-term expansion plans.

The Brazilian 1954 Railway Programme

The 1954 programme of railway improvements in Brazil provides for an expenditure of 2,500 million cruzeiros (£50,000,000). Realignments and deviations will cost 1,400 million cruzeiros; electrification 300,000,000; motive power and rolling stock 300,000,000; and administration and sundries 500,000,000. In addition to these normal disbursements the National Bank for Economic Development and the International Bank for Reconstruction & Development will advance 2,000 million cruzeiros and U.S. \$30,000,000, respectively, to finance projects recommended by the Mixed Brazil-United States Commission.

By a United States decision financial aid for Latin American development will be left in future more to the International Bank, instead of to the Export-Import Bank, whose funds are drawn from the U.S. Treasury. As Export-Import Bank loans are used exclusively to finance imports from United States, while those of the International Bank may be used in any country, the decision has been opposed, but unsuccessfully, by American manufacturers and exporters.

The Goiás Railway is to replace light by heavier rails and acquire steam locomotives, coaches and wagons at a cost of £4,997,760. The Victoria-Minas Railway will purchase five diesel-electric locomotives of 1,125 h.p. and four of 1,000 h.p. and one diesel-hydraulic of 1,900 h.p.; the cost, including spare parts, is estimated at the equivalent of £692,834.

The Central Railway will improve the section between Joaquim Murtinho and Belo Horizonte (127 km.), shortening the distance by 35 km. and adding a third track; relay 153 km. with 45 kg.-per-metre rails between Esperança and Sete Lagoas; and purchase 880 wagons and 83 coaches and maintenance equipment. The estimated cost is 588,413,000 cruzeiros (£11,768,260) in local currency and U.S. \$1,763,000 for imports. The Araraquara Railway will lay broad gauge between

Araraquara and Mirassol (250km.), shortening the distance by 31 km., and purchase maintenance equipment, 14 diesel locomotives, 20 coaches and 235 wagons; 471 existing wagons will be adapted for the broad gauge. The estimated cost is U.S. \$8,800,000 for imports and 19,528,000 cruzeiros (£390,560) to be expended locally. The Rede Ferroviário Leste Brasileiro will complete the electrification of its suburban lines at Salvador, capital of Bahia, and receive ten electric locomotives, built in Brazil by Industrias Reunidas Ferro e Aço (I.R.F.A.).

Of 4,205 broad-gauge and 9,467 narrow-gauge wagons to be purchased under the Brazil-U.S.A. Commission's projects, 1,635 will be built in Brazil for the Central Railway. The Emergency Plan for Development of the Amazon Basin allots the equivalent of £1,715,200 to improvements to power and transport services in 1954. Part of the sum will be expended for work and materials on the Tocantins and Madeira-Mamoré Railways. In February, the National Bank for Economic Development was authorised to advance 645,159,400 cruzeiros (£12,903,188) to the Parana-Santa Catarina Railway for urgent improvements, without waiting for a loan from the International Bank. In February, also, the Mogiana, Goiás, Parana-Santa Catarina and Noroeste Railways were authorised to order immediately 250, 150, 200 and 100 wagons, respectively, from local manufacturers. An extensive programme of works is to be put in hand in Rio Grande do Sul in 1954, including the extension of the line from Jacaré to General Luz (100 km.); realignment between Porto Alegre and Passo Fundo, reducing the distance from 680 to 290 km.; construction of a line from Pelotas to Barretos (250 km.) and its connection to the Jacuí Railway, which serves the Butiá coalmines.

Railway tariffs are to be revised in 1954, bringing them more into line with the present costs of labour and materials. The Brazilian railways are suffering increasingly from the competition of road transport services. Federal, State and municipal authorities will spend approximately £160,000,000 on building and modernising roads in 1954 and remunerative traffic will be diverted more and more to road trans-

port as new roads are built and existing roads paved. The number of wagons loaded by the five principal railways has decreased from 162,143 in 1944 to 152,481 in 1950 and 131,276 in 1953. Between 1950 and 1953 the number of loaded wagons circulating on the Paulista system has dropped from 49,555 to 46,055; on the Santos-Jundiaí, from 56,309 to 37,539; on the Sorocabana, from 22,413 to 21,416; and on the Mogiana, from 7,871 to 5,968. Comparing the same years, the average daily number of lorries running over the Petropolis-Juiz de Fora road increased from 521 to 1,550; between Rio and São Paulo, from 553 to 3,220; and between Lajes and Porto Alegre, from 368 to 1,727.

North Eastern Region Road Motor Horsebox Service

In the opening week of the flat racing season the North Eastern Region of British Railways, which has 18 road motor horseboxes, carried 91 horses. Eighty were taken to the Lincoln and Liverpool meetings, five to Ayr and Utoxeter, and six to local hunts. Yorkshire, with its 77 training establishments, is the hub of this flourishing traffic by which nearly 9,000 horses are transported 250,000 miles a year.

The chief centres are Malton, the largest training centre in the North, and Middleham, with approximately 300 horses at each. Road journeys are made to places as far afield as Epsom, Ascot, Goodwood, Newmarket, Lanark, and Perth. The longest journey made was Folkestone.

A stable boy and the head lad travel with each horse, no other person being allowed in the vehicle.

Notable winners carried in British Railways horseboxes include Dante (The Derby, 1945), Sheila's Cottage (Grand National, 1948), Musidora (The Oaks, 1949), the French horse Talma II (St. Leger, 1951), and Nearula (2,000 Guineas, 1953).

Road motor horseboxes were first operated in the North Eastern Area of the L.N.E.R. in 1931, when two boxes were placed in service at Malton as an experiment. They were used both for C. & D. work in connection with rail services and for throughout journeys by road. In 1932,



British Railways, North Eastern Region, motor horsebox, showing two front stalls and partition, and window of attendant's compartment at back

four more motor horseboxes were introduced which enabled the road service to be extended to include Middleham and elsewhere. The following year saw the acquisition of the road motor horsebox business operated in the area by Daimler Hire Service Limited, and this, with one or two other additions, brought the fleet up to a total of 16 vehicles.

The fleet now consists of 18 three-stall boxes. This type, with two stalls at the front and one at the rear, has been adopted as the standard. The stalls are completely separated by partitions and the horses travel with head to the rear of the vehicle. Compartments are provided for attendants and there is room for fodder.

The services in general are under the control if the Regional Commercial Superintendent, but the responsibility for day-to-day operation rests with stationmasters at the various centres where the vehicles are located. In addition, there is a Road Motor Horsebox Outdoor Representative, who maintains contact with trainers, breeders, and others requiring conveyance of horses by road vehicle; he is also responsible for the immediate supervision of the vehicles when they are away from their bases at race meetings and sales.

The greatest part of the traffic consists of racehorses, either between stable and station or racecourse, or from stable to racecourse throughout by road, but there is also an important traffic in bloodstock to and from sales, brood mares and foals, hunting and in connection with agricultural shows.

Questions in Parliament

Fares in London Area

Mr. Ernest Davies (Enfield E.—Lab.) on April 7 asked what action the Government proposed to take in view of the new proposals by the B.T.C. for increased fares in the London Area.

Mr. Alan Lennox-Boyd (Minister of Transport & Civil Aviation) stated in a written reply that the outcome of the public inquiry to be held by the Transport Tribunal would be awaited.

Parliamentary Notes

Permanent Way Maintenance

In the House of Lords on April 6, Lord Somers asked the Government what action they proposed to take to urge the British Transport Commission to carry out better maintenance of the permanent way on British Railways, especially in tunnels. The supervision of the permanent way was not really adequate at the present day. He had often noticed stretches of line where the keys had fallen out of the chairs. There were branch lines where one saw ancient sleepers and points which showed that the rails were badly worn. He cited the Watford tunnel mishap on February 3 and said that an examination of the permanent way afterwards showed that nineteen rails were cracked. In the opinion of experts, those rails were cracked before the accident. Apparently a six-monthly inspection of the permanent way had been ordered, but through lack of manpower could not be carried out.

Lord Hawke (Lord in Waiting), who replied for the Government, said that Lord Somers had made a number of quite sweeping comments about the conduct of the railways. The way he had put his question might raise some doubts in the

minds of the travelling public as to the general safety of travel on British Railways. He therefore wished to state categorically that, in the opinion of Her Majesty's Government, as advised by their technical advisers, there was no ground whatsoever for any such doubt.

British Railways engineers and operators, who had always regarded safety as their first aim, still continued to do so, and were applying all their unrivalled experience, married to the latest moves of science, to the end of safety.

So long as there were railways there would always be a few cracked and broken rails. The great thing was to find them quickly and have them out of the track. The railways were now following the London Transport railways in providing ultrasonic rail flaw detectors. Every main line in the country was patrolled and inspected every day. The Minister saw no reason to intervene.

Staff & Labour Matters

Railway Wage Discussions

At a meeting between representatives of the three railway trade unions and the Chairman, Sir Brian Robertson, and other representatives of the British Transport Commission on April 7, Sir Brian Robertson laid before the unions the Commission's proposals for a revised wages structure for salaried and conciliation staff employed on British Railways. As a result of this action the A.S.L.E.F. decided the next day to call off the strike of their members which they had threatened would take place on April 24 unless the proposals were received.

The Executive of the T.S.S.A. decided at a meeting on April 11 to reject the Commission proposals on the new salaries structure. It is understood that the main objection of the Association is that the pay of salaried staff should be negotiated separately and should not be linked with that of other grades. At the time of going to press the other two unions have not announced their reaction to the proposals of the Commission.

The General Secretary of the N.U.R., Mr. J. S. Campbell, writing in the *Railway*

Review of April 9, states that he has made the position of the N.U.R. perfectly clear. If a new wage structure is to be created, it must be anchored to a firm foundation and that foundation must be a satisfactory minimum wage, the desire being to build upon a satisfactory minimum wage in the terms of skill and responsibility for every grade covered by the machinery of negotiation. Mr. Campbell stresses, however, the desire of the N.U.R. to attempt to see justice done for every grade regardless of whether they are low paid or whether they are in the higher income groups.

Strike on Liverpool Overhead Railway

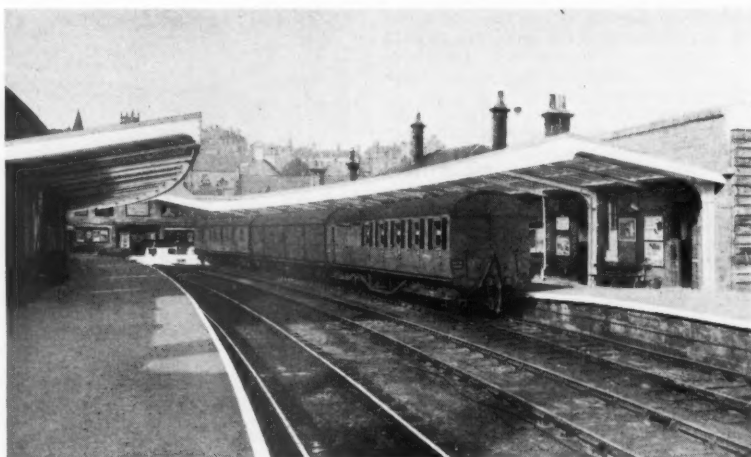
An unofficial strike began on the Liverpool Overhead Railway on April 12. The reason is reported to have been the refusal of the railway company to grant to the staff the same increases as were recently awarded to the staff of British Railways and London Transport railways; a smaller increase is stated to have been offered by the company, but to have been refused by the N.U.R. The strike was continuing as we went to press.

Engineering Workers' Wages

The executive members of the 39 unions affiliated to the C.S.E.U. agreed at a meeting in York on April 8 to accept the wage increases offered by the employers for engineering workers. The increases are 8s. 6d. a week for skilled, 7s. 6d. for semi-skilled, and 6s. 6d. for unskilled workers. The cost of the increases which will be effective from April 5 is estimated at £60,000,000 a year.

DESOUTTER BROS. (HOLDINGS) LTD.—The report of the chairman of Desoutter Bros. (Holdings) Ltd. for 1953 states that home sales show an increase of approximately 12 per cent on the previous 12 months. Despite intensive overseas competition, the company's sales abroad have increased by nearly 3 per cent. Total income for the year amounted to £410,239 compared with £387,933 for 1952. Net profits were £127,938 (£65,366). A final ordinary dividend of 12½ per cent is recommended, making 20 per cent for the year. Consolidated capital and reserves at the year-end were £1,030,851 (£942,483).

New Roof at Whitby Town



Whitby Town Station, North Eastern Region, showing new glazed cantilever-type roof which includes improved lighting

Contracts & Tenders

The British Transport Commission has placed an order for 2,200 16-ton steel standard wagons with R. Y. Pickering & Co., Ltd. The contract is valued at about £750,000.

The British Transport Commission has authorised the Eastern Region of British Railways to order a new train ferry for the Harwich-Zeebrugge service to replace the *Essex Ferry*. The contract has been placed with John Brown & Co. (Clydebank) Ltd.

British Railways, Eastern Region, have placed the undermentioned contracts:—

Tersons Limited, London, N.3: renewal of permanent way in the Peterborough District
R. F. Herron Limited, Ruislip: reconstruction of roof to unclaimed goods warehouse at Kings Cross Goods Depot

Wellerman Bros. Ltd., Sheffield, 3: construction of occupation road overbridge No. 21 between Gedling and Daybrook

British Railways, North Eastern Region, have placed the following contracts:—

F. & J. Watkinson, Bradford: additional work in connection with repairs to roof, Manningham Motive Power Depot

Henry Lees & Co. Ltd., Motherwell: coaling plant, Thornaby New Motive Power Depot

G. Brunt & Son, Castleford: erection of new standard signalbox, type "B," Ferrybridge
Arthur Robinson (Contractors) Limited, Middlesbrough: slag filling, Thornaby New Motive Power Depot

Brighouse Estate Co. (Northern) Ltd., Brighouse: provision of maintenance facilities for lightweight trains, Bradford Hammerton Street Motive Power Depot

Consolidated Pneumatic Tool Co. Ltd., Gateshead: impact wrenches, Walker Gate Works

Howard Pneumatic Engineering Co. Ltd., Eastbourne: provision of eight "John Bull" rail drills with saw attachments and clamps

The Special Register Information Service, Board of Trade, Export Services Branch, states that the British Embassy at Cairo has reported that the Egyptian State Railways are calling for tenders for 27 diesel shunting locomotives to E.S.R. Specification 668. The closing date for the receipt of tenders is June 21.

A copy of the specification against a cash payment in advance of £E.10 for each copy may be obtained from the E.S.R. Mechanical Department, Saptieh, Cairo, or from the Office of the Chief Inspecting Engineer, Egyptian Republic, 41 Tothill Street, London, S.W.1.

The Special Register Information Service of the Board of Trade, Export Services Branch, states that the U.K. Trade Commissioner at Johannesburg reports that the Stores Department, South African Railways, is calling for tenders for carriage fittings (39 items, including door locks, catches, brackets, handles and hinges).

The closing date for tenders is May 13. They must be enclosed in a sealed envelope inscribed on the outside "Tender No. B. 6310: For Carriage Fittings" and addressed to the Chairman, Tender Board, P.O. Box 7784, Johannesburg. A copy of the tender documents, including specifications and conditions of contract, is available on loan to United Kingdom firms in order of application to the Branch, at Lacon House, Theobalds Road, London, W.C.1.

The Director General of Supplies &

Disposals, New Delhi, is inviting tenders for:—

- (a) 225 casings for buffer (b.g.)
- (b) 1,250 plunger buffer with nut for "KC" type buffer

Tenders are to be submitted to the Director General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting reference SRI/16154-E/III for (a) and SRI/17292-D/III for (b). They will be received up to 10 a.m. on April 29.

The Special Register Information Service, Board of Trade, Export Services Branch, states that the United Kingdom Trade Commissioner at Delhi has reported that the Directorate General of Supplies & Disposals, Government of India, is calling for tenders for:—

- Ten injectors, combination, complete, 9 mm., for "YB" class locomotives
- 40 injectors, combination, complete, 8 mm., for "ABP" and "NP" class locomotives
- 65 injectors, combination, complete, 7 mm., for "ABP" and "YF" class locomotives

The closing date for receipt of tenders is May 7. Tenders should be submitted to the Director-General of Supplies & Disposals, Shahjahan Road, New Delhi. A set of the tender documents, including conditions of contract and drawings, is available for loan to United Kingdom firms in order of application to the Branch, at Lacon House, Theobalds Road, London, W.C.1.

The Director General of Supplies & Disposals, New Delhi, is inviting tenders for:—

- (a) 520 horn cheek axle guard, 1 ft. 4 in. long, for I.R.C.A. electric trailer coaches and I.R.S. four-wheel stock (material, high-duty cast iron to Grade 17 of I.R.S.S. No. M-31)
- (b) 33 coupling rods for "YB" class locomotives
- (c) 12 fully-machined cast-steel wheel centres for "IM" class coupled wheels

Tenders are to be submitted to the Director General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting reference SRI/16890-D/I (a) for (a); SRI/16084-E/II for (b), and SRIA/16220-E/I for (c). They will be received up to 10 a.m. on (a) April 29; (b) April 30; (c) April 30.

Forms of tender are only available for purchase in India from the Deputy Director General (Supplies), Directorate General of Supplies & Disposals, New Delhi; Director of Supplies & Disposals, Bombay or Calcutta; Deputy Director of Supplies & Disposals, Madras.

If the date for the receipt of the foregoing tenders does not allow sufficient time for tenderers to obtain tender forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations already submitted.

A copy of the tender forms can be examined at the India Store Department, 32-44, Edgware Road, London, W.2, on application to the "CDN" Branch and the drawings can be seen at the offices of Hodges, Bennett & Company, 59-60, Petty France, London, S.W.1, from whom copies may be obtained at a fixed price per sheet.

Notes and News

Locomotive Maintenance Inspectors and Running Shed Foremen Required.—Applications are invited for the posts of locomotive maintenance inspectors and running shed foremen required by the Nigerian Government Railway, for one tour of 12 to 24 months in the first instance. See Official Notices on page 451.

Doubly-Flexible Rail-to-Sleeper Fastenings.—The photographic illustrations in the article in our March 26 issue were reproduced by courtesy of the *Revue Générale des Chemins de Fer*, Paris, to which also we are indebted for much of the information supplied.

"Starlight Special" Advance Bookings.—British Railways reported last week that 37,000 advance bookings already had been made for the 1954 "Starlight Special" overnight excursion trains between London and Edinburgh and Glasgow, the first of which, this year, left last Friday evening. This compares with 25,000 advance bookings before the start of the "Starlight Specials" in 1953.

British Railways Coal, Iron and Steel Traffic.—The tonnage of iron and steel conveyed by British Railways from the principal steelworks during the week ended April 3 was 238,499, the heaviest since records have been taken in 1951. In addition 315,600 tons of iron ore were carried. During the week ended 6 a.m. on April 12, 3,346,450 tons of deep-mine and opencast coal were conveyed, the heaviest figure since Christmas; this includes 408,120 tons cleared during the weekend.

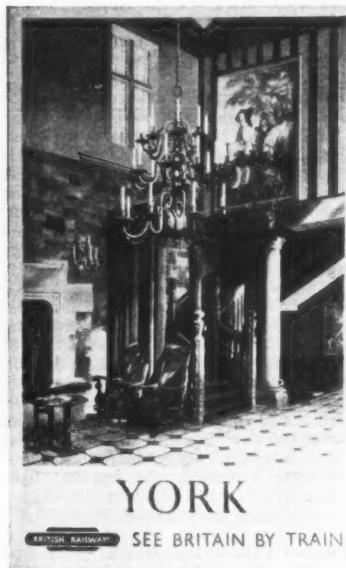
Staffa No. 1 Production Bender.—Chamberlain Industries Limited, of Staffa Works, Leyton, has added to its range of hydraulic pipe bending equipment. The firm has recently developed, in conjunction with Walter P. Hill, Inc., of the U.S.A., a high-speed hydraulic production tube bender. The unit for supplying the hydraulic power is a separate entity to minimise vibration and simplify maintenance. The tubes are bent cold and unloaded over a conventional former, and the bending operation is automatic with each loading.

London Midland Region Ambulance Competition.—The finals of the London Midland Region ambulance competition were held in the King's Hall, Belle Vue, Manchester, on April 9. The winners were the Camden team with 484 marks and the runners-up were Derby Erecting Shops with 479 marks. Mr. J. W. Watkins, Chief Regional Manager, was among those present. The chair was taken by Mr. R. Simpson, Regional Staff Officer. The prizes were presented by Mrs. E. S. Hunt, wife of Mr. E. S. Hunt, Assistant Chief Regional Manager, and Dr. G. E. Graves Peirce, Regional Medical Officer, also spoke, as did Mr. R. O. Banister, Divisional Operating Superintendent, Manchester, and Mr. S. T. Clayton, Motive Power Superintendent, London Midland Region.

Bruce Peebles & Co. Ltd.—The report and accounts of Bruce Peebles & Co. Ltd. for the year ended December 31 last show a net profit of £137,000. The statement by the Chairman, Sir William Y. Darling, draws attention to the fact that an overdraft of £50,000 at the beginning of the year has been converted to a substantial surplus. In view of the exceptional results a special bonus of 10 per cent on the ordinary stock has been recommended. The

intake of orders during 1953 has shown an appreciable reduction and efforts are constantly being made to speed up production in order to keep abreast of the increasingly competitive markets at home and abroad.

North Eastern Region Poster of York.—An interior view of the Treasurer's House at York forms the subject of a new poster produced by the North Eastern Region and shown in the accompanying illustration. This poster, lithographed in twelve



The Treasurer's House, York, depicted in a North Eastern Region poster

colours from a painting by "Shep" (Captain J. C. M. Shepard, F.S.A.) will be displayed throughout Great Britain and copies will be sent to Canada and the United States. A National Trust property, the Treasurer's House dates from the appointment of the first Treasurer, Radulphus, in the year 1100. In the thirteenth-century basement are traces of the Roman Imperial barracks and a portion of an old Roman road. The office of Treasurer of York Minster became extinct in the reign of Henry VIII, but has recently been revived.

Craven Bros. (Manchester) Ltd.—The profits for the year 1953 of Craven Bros. (Manchester) Ltd. were £268,384 compared with £262,740 for 1952. A tax deduction of £172,000 (£174,000) leaves a net profit of £96,384 (£88,740). An interim dividend of 5 per cent has already been paid on a capital of £300,000, and, following a 6½ per cent scrip issue, a final ordinary dividend of 12½ per cent is proposed on a capital of £500,000. In 1952 an interim dividend of 5 per cent, a final dividend of 10 per cent, and a special centenary bonus of 10 per cent were paid on the capital of £300,000.

Permanent Way Institution: Summer Convention.—The Permanent Way Institution has now issued its preliminary programme in connection with the Summer Convention which will be held this year at Scarborough from Saturday, May 29, to Thursday, June 3. A number of interesting visits have been arranged by train and coach to works at

Tees-side, York and Hull, and places of interest round about. On Saturday, May 29, at 2.30 p.m. at the Public Library, Vernon Road, Scarborough, the annual summer general meeting of the Permanent Way Institution will be held. The chair will be taken at this meeting by Mr. M. G. R. Smith, Civil Engineer, British Railways, Western Region, and President of the P.W.I.

Institute of Transport: Berks, Bucks & Oxford Section.—This Section of the Institute of Transport extended the scope of its activities on March 29, when, for the first time, a meeting was held in Slough. Mr. L. J. Taylor, Chief Inspector of Postal Facilities for Great Britain, delivered an address on "The Post Office and Transport."

Mount Lyell Mining & Railway Co. Ltd.—The operations of the Mount Lyell Mining & Railway Co. Ltd. (Tasmania) in the year ended September 30 last resulted in a net profit of £200,313. The pyrites-carrying capacity of the railway was increased to about 70,000 tons a year by the delivery of two Drewry diesel locomotives and five more steel hopper wagons.

Powers-Samas Accounting Machines Limited.—The consolidated trading profits for 1953, subject to audit, of Powers-Samas Accounting Machines Limited, amounted to £1,154,107 compared with £1,180,626 in the previous year. Net profits were £268,829 (£284,300). The final dividend proposed is 1s. 4½d. a 10s. share, making a total of 2s. 3d. a share (same).

Keith Blackman Exhibits at the B.I.F.—Keith Blackman Limited will exhibit a comprehensive range of Tornado and Extravent fans at the forthcoming British Industries Fair at Castle Bromwich. Of special interest will be a Tornado 33-in. trunnion-mounted, marine-type axial fan. The impeller has true aerofoil section blades cased in aluminium-silicon alloy, driven by a shunt-compound wound d.c. motor. A feature of the design is accessibility; access to the motor and impeller is by two large quick-release doors. Also of special interest is a new Tornado 16-in. type APA propeller-axial fan designed for quiet operating under free air on light resistance conditions. The impeller has three blades, which are mounted on the fillets of the hub. Each one-piece pressed-steel blade is curved anti-elastically which gives great strength and rigidity, with non-overloading characteristics and high efficiency coupled with high volumetric capacity.

Easter Train Services.—The Eastern Region of British Railways has arranged to run 355 additional trains over the Easter holiday between April 14 and 21. The greatest number, 129, will run on April 15. Included in these totals are many trains from London serving the West Riding of Yorkshire, Newcastle, Edinburgh, Glasgow, Aberdeen, and the principal East Anglian towns. Kings Cross is the starting point of 101 additional trains and 71 start from Liverpool Street. There are also additional cross-country and through services. The London Midland Region is running 1,149 extra main-line expresses between April 13 and 21. This programme includes 220 extra trains to and from Euston and 133 into and out of St. Pancras. The busiest days were expected to be April 15 for outgoing passengers, with 211, and April 19 with 311 extra trains. The Western Region has planned to run

more than 300 special long-distance trains between April 14 and April 20. On the Thursday there were to be 100 additional trains and on Easter Monday 80 extra trains will run. Services on April 20 will be augmented by 66 trains. A full programme of day and half-day excursions has been arranged throughout the Region.

Mather & Platt Limited.—The consolidated total income of Mather & Platt Limited for 1953 amounted to £1,758,910 compared with £1,713,837 for the previous year. Net profits were £558,606 (£428,790). The total ordinary distribution is 15 per cent (same). Consolidated current assets total £7,148,571 (£6,735,591).

The Skefko Ball Bearing Co. Ltd.—Payment of a final dividend of 9d. per stock unit of 5s. tax-free making a total of 1s. per stock unit of 5s. tax-free for the year ended December 31, 1953, has been recommended by the directors of the Skefko Ball Bearing Co. Ltd. The balance of profit for the year was £370,901 compared with £353,597 in 1952. The amount carried forward from 1952 is £201,640, making available £572,541. Dividends take £180,000, transfer to replacement of fixed assets reserve £100,000, and to general reserve £100,000 leaving £192,541 carried forward.

Brush Electrical Engineering Co. Ltd.—A dividend of 6 per cent is to be paid by the Brush Electrical Engineering Company for the year ended December 31, 1953. This compares with 4 per cent for the previous year. The net profit, after tax, is £404,078 but this is not comparable with the 1952 figure of £136,990. In 1952 the loss of £308,970 on tube well contracts in India was met from current profits. The 1953 loss was reduced to £159,877 and covered by a reserve of £180,000 made from the general reserve in 1952. An additional provision of £250,000 has been made in 1953 by transfer from general reserve and this is designed, after taking into account expected taxation relief, to cover the losses which may be incurred in closing down the Indian tube well operations entirely.

The International Nickel Company of Canada Limited.—The net earnings for 1953 of the International Nickel Company of Canada Limited, expressed in U.S. currency, were \$53,694,526, compared with \$58,891,282 in 1952. Net earnings for each common share were \$3.54 (\$3.90). Common and preferred dividends amounted to \$36,192,596 (\$39,837,138). During the year the capacity and production rate was increased by 24,000,000 lb. of nickel and 20,000,000 lb. of copper, bringing the annual nickel producing capacity to over 275,000,000 lb. The quantity of ore mined was 13,667,095 tons which is the highest in the history of the company. The demand for nickel still exceeds the supply, largely because of military demands. A new process has been developed to recover nickel from pyrrhotite and construction of a \$16,000,000 plant has commenced as a first unit in an operation which will ultimately recover 1,000,000 tons of by-product iron ore each year.

Alfred Herbert Limited.—The final dividend proposed by Alfred Herbert Limited, machine-tool makers, is 7½ per cent, making a 12½ per cent tax-free distribution for the year ended October 31 last. The corresponding figures for the previous year were 5 and 10 per cent with a special capital dividend of 15s. per cent. Net profit, after tax provision, is £1,348,095, compared with

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

DESIGN ENGINEER required for development of structures for Overhead Electrical Transmission Lines, Railway Electrification, Aerial Ropeways, Floodlight Towers, etc. Successful applicant, who should have had a thorough theoretical training and practical experience in the design and application of these structures, would be expected to control and organise his own Department. Good prospects are offered to a man of initiative and resource. Box 175, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

LOCOMOTIVE MAINTENANCE INSPECTORS M2C/30225/RA RUNNING SHED FOREMEN M2C/30208/RA required by the NIGERIAN GOVERNMENT RAILWAY for one tour of 12/24 months in the first instance. Outfit allowance £60. Free passages for officers and wives and assistance towards cost of children's passages or grant of up to £150 annually for their maintenance in U.K. Liberal leave on full salary. M2C/30225/RA. Candidates must have served 5-year railway apprenticeship followed by at least 10 years running shed experience and must have reached Class II Shed Master or Class I Mechanical Foreman. M2C/30208/RA. Candidates should have served an apprenticeship in a main locomotive workshop and have had at least seven years subsequent experience in a Running Shed. They must be thoroughly acquainted with all branches of Running Shed fitting and with periodical examinations of locomotives. Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote reference number against the post for which application is made.

TRANSLATIONS (Technical, Research, Commercial), all languages carried out by experts. Instruction manuals, patent specifications, conference papers, brochures, sales literature. Abstracts also supplied. Olympia Translation Service, 149, Blythe Road, London, W.14. RIVERSIDE 5135.

CHIEF DRAUGHTSMAN for important Engineering concern, experience with electric and diesel locomotive design an advantage but not essential. Candidates must have first class practical mechanical experience. Starting salary £1,200 to £1,500 with superannuation. Box 173, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

BOUND VOLUMES—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press, Limited, 33, Tothill Street, London, S.W.1.

£1,186,254 in the previous year. This includes a credit of £133,323 for taxation over reserved in previous years.

Clayton Dewandre Co. Ltd. Results.—The directors of Clayton Dewandre Co. Ltd. recommend a final dividend of 20 per cent, against 15 per cent in 1952, which makes a total of 25 per cent for 1953 (20 per cent). Net profit, after all charges, was £158,850 (£114,015). An addition of £11,650 is made from reserves no longer required for taxation, making £170,500. The Capital Issues Committee has consented to the capitalisation of £204,750 of reserves which it is proposed to apply in issuing three ordinary £1 shares for every £5 of ordinary stock held.

English Electric Co. Ltd.—The current assets of the English Electric Co. Ltd. exceeded current liabilities at December 26, 1953, by £23,589,288. The continued growth of business made it necessary to raise more capital. The profit for the year was £1,553,897. After deducting preference stock dividends and an interim dividend of 5 per cent on ordinary stock there remained a balance of £1,508,012. The directors have recommended a final dividend of 6½ per cent on £10,616,193 ordinary stock less tax. This sum plus that transferred to general reserve, will mean a carry forward of £538,646.

James Neill & Co. (Sheffield) Ltd: Exhibits at the B.I.F.—A comprehensive range of Eclipse hack saw blades and frames, precision tools and magnetic chucks will be among the exhibits of James Neill & Co. (Sheffield) Ltd. at the forthcoming British Industries Fair at Castle Bromwich. The equipment includes hack saw frames and blades, surface gauges, angle plates and so on. Also included will be a series of permanent magnet chucks, both rectangular and circular ranging from 10 in. to 24 in. in the rectangular type, and 4½ in., 6½ in., and 9 in. in the circular models. Other exhibits will include a new accessory for magnet chucking in the form of swivelling brackets for use in conjunction with the Eclipse permanent magnet chucks type AX. 105 and 146, to provide a tilting chuck capable of tilting through a full 90 deg. angle. A new introduction includes the Eclipse No. 79 saw set for circular saws, which is designed for setting teeth of large circular saws up to 10 gauge thick.

Montreal Locomotive Works Limited.—Substantial gains in operating income and net profit for the year ended December 31, 1953, are reported by Montreal Locomotive Works Limited. After providing \$1,130,000 for income taxes against

\$670,000 in 1952, the net profit was \$1,156,140 (\$735,831). The net profit was equal to \$1.65 per share (\$0.55). Operating income was \$2,145,509 (\$1,349,223), and investment income amounted to \$165,370 (\$160,385). Dividends on common stocks totalled 80 cents a share in each year. At the close of 1953, current assets were \$17,179,453 and current liabilities \$5,314,577. Net working capital was \$11,864,876 (\$11,097,328). The directors' report states that shipments of diesel-electric locomotives and parts continued to accelerate in volume. Under present conditions, unfilled orders at \$9,600,000, compared with \$16,500,000 at this time last year, are considered satisfactory.

East African Railways Contribution to New Kenya Legislative Council Chamber.—The East African Railways & Harbours have provided for the new Kenya Legislative Council Chamber a despatch table, which in general design is similar to that used in the House of Commons. The table is 12 ft. 3 in. long, 7 ft. wide and 3 ft. 9 in. high. It was made in the Mechanical Workshops of the East African Railways & Harbours in Nairobi by skilled African

and Asian artisans working under European supervision and contains upwards of two tons of Mvuli timber. When completed the table was erected in the workshops and was later dismantled and re-erected in situ. Bookcases for the library and many other fittings for the new buildings were also made in the East African Railways Workshops.

Consolidated Signal Co. Ltd.—The profit of the Consolidated Signal Co. Ltd. for the year ended September 26 last was £34,145. The balance of profit was £37,129. The directors have recommended the payment of a dividend on the cumulative preference stock at the rate of six per cent and on the ordinary stock at that of 30 per stock, both less income tax.

York Railway Institute Players.—Two of the three awards at the first drama festival arranged by the British Railways Staff Association, North Eastern Region, and held at York on April 3, were won by the York Railway Institute Players. The producer, Ann Shaw, was awarded the trophy and plaque for the best group performance, Tom Oldham, of the District Commercial



Despatch table in the new Kenya Legislative Council Chamber, made and presented by the East African Railways

Superintendent's Office, York, the plaque for the best male performance, and Eleanor Walker, a 26-year-old clerk of Newcastle, the plaque for the best female performer, for her role in a light comedy. Mrs. H. A. Short, wife of the Chief Regional Manager, made the presentations. Mr. Short thanked the adjudicator, Mr. J. L. Styan, staff tutor in drama at the University College of Hull, and forecast that next year a larger hall would have to be taken for the festival.

"Express Freight" Poster.—The colour poster reproduced on page 403 of last week's issue and stated to be a product of the Department of the Chief Public Relations & Publicity Officer, British Transport Commission, was produced by that of the Public Relations & Publicity Officer, London Midland Region.

Eastern Region Women's First Aid Competition.—The winning team in the Women's Final of the Eastern Region First Aid competition, held at the Bishopsgate Institute recently, was Marylebone. Mr. C. K. Bird, Chief Regional Manager, presented the shield to the captain of the team and each member received a clock.

Birmingham Railway Carriage & Wagon Co. Ltd. Results.—The annual meeting of the Birmingham Railway Carriage & Wagon Co. Ltd. will be held in Birmingham on April 28. The profit for the year ended December 31, 1953, is £81,344 compared with £110,570 for the previous year. The directors' recommendations include a dividend at the rate of 6 per cent. per annum on the preference stock for the half-year ended December 31, which with the interim dividend already paid amounts to £3,300 net and an ordinary dividend of 10 per cent per annum (the same as last year) amounting to £54,504 (the same). A balance of £141,169 (£138,316) will then remain to be carried forward.

Forthcoming Meetings

April 20 (Tue.) to April 24 (Sat.).—Model Railway Exhibition in the Central Hall, Westminster, London, S.W.1. Tuesday, 2 to 9.30 p.m., Wednesday to Saturday inclusive, 10.30 a.m. to 9.30 p.m.

April 20 (Tue.).—Stephenson Locomotive Society, Coventry Centre, at the B.T.H. Social Rooms, Holyhead Road, Coventry, at 7.30 p.m. Ciné films, "Railway scenes old and new," by Mr. H. J. Stretton Ward.

April 21 (Wed.).—Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W.1, at 5.30 p.m. Paper on "Locomotive diagramming and utilisation," by Mr. L. C. Welborn.

April 22 (Thu.) to September 25 (Sat.).—"Popular Carriage" Exhibition (Two centuries of carriage design for road and rail) in the Shareholders' Meeting Room, Euston Station, London, N.W.1. Weekdays 10 a.m. to 7 p.m., Sundays 2 to 7 p.m.

April 22 (Thu.).—Institute of Transport, Humberstone Section, at the Chamber of Commerce & Shipping, at 7.30 p.m. Paper on "Swiss Federal Railways," by Mr. H. O. Ernst, London Manager, Swiss National Tourist Office.

April 24 (Sat.).—British Railways, Southern Region, Lecture & Debating Society. Morning visit to the National Physical Laboratory at Teddington.

April 26 (Mon.).—Institute of Transport, Berks, Bucks & Oxon Section, at 22, Thorn Street, Reading, at 7 p.m. Paper on "Transport in industry," by Mr. J. H. Criddle, followed by annual general meeting.

April 27 (Tue.).—Institute of Transport, at the Connaught Rooms, Great Queen Street, London, W.C.2, at 12.30 for 1 p.m. Informal luncheon.

April 28 (Wed.) to May 1 (Sat.).—Institute of Welding, Spring Meeting, in South Wales and Bristol.

April 30 (Fri.).—Stephenson Locomotive Society, North Western Centre, at the Liverpool Engineering Society's Rooms, Dale Street, at 7.45 p.m. Illustrated lecture, "Great Northern cavalcade," by Mr. R. A. H. Weight.

April 30 (Fri.).—British Railways, Southern Region, Lecture & Debating Society. Visit to York.

May 1 (Sat.).—Stephenson Locomotive & Manchester Locomotive Societies, at 2.15 p.m. Special train tour from Preston to Longridge, Knott End Railway, Glasson Dock, Sandside, etc.

May 1 (Sat.).—Permanent Way Institution, East Anglia Section. Visit to Lowestoft Harbour Works and Sleeper Depot.

May 3 (Mon.) to May 12 (Wed.).—Institute of Transport. Visit to France.

May 4 (Tues.).—Railway Students' Association. Morning visit to London Transport Loughton Garage.

May 26 (Wed.) to May 29 (Sat.).—British Railways & London Transport Exhibition of latest developments of railway locomotives, rolling stock, and engineering equipment at Willesden Motive Power Depot. Wednesday 3 to 7 p.m. Thursday to Saturday inclusive, 10 a.m. to 7 p.m.

Railway Stock Market

The upward trend in stock markets gathered strength in the industrial sections, and business generally has remained on a substantial scale. There is no doubt that the City takes an optimistic view of the outlook, despite Mr. R. A. Butler's cautious Budget. The disposition is to assume that the trade recession in the U.S.A. is a temporary development and is unlikely to worsen.

It is argued moreover in some quarters that the fact Mr. Butler has not made any outstanding tax concession indicates confidence in the trade outlook, and that if he feels a stimulus is needed he can always reduce the bank rate. British Funds have participated in the renewed upward trend in markets. There have been some big gains in shares of engineering and kindred companies making plant and machinery, because it is expected the tax concession in respect of plant bought by industrial companies will give an important stimulus to the re-equipment of industry.

There has been rather more activity in foreign rails. Manila Railway stocks were again outstanding in the belief that at long last an important move is planned for dealing with the big arrears of interest on Manila Railroad bonds. There has, however, been no official news when the representatives of the Philippines Government can be expected to visit London. Arrears of interest on the Railroad company's bonds date from 1942, and in the event of liquidation of the Railroad company, the debentures of the latter would have a break up value of par plus the arrears of interest. The five per cent non-cumulative £1 preference shares would have a break up value of par, while any remaining balance would go to the 1s. ordinary shares. Value of the ordinary shares could be anything from nothing to £3 according to the debt settlement finally agreed in respect of the Manila Railroad bonds.

This week speculation has increased in all stocks of the Manila Railway, the "A" debentures rising further to 98 and the "B" debentures to 88. The preference shares have advanced to 13s. because if there is a reasonable settlement, they would be worth 20s. The ordinary shares are attracting considerable attention as a speculation and have risen to 7s. 6d.

In other directions, Dorada ordinary stock has been rather more active around 72. Guayaquil & Quito 5 per cent bonds

changed hands at 52, and Paraguay Central debentures around 19.

Nitrate Rail shares eased to 20s. 3d. and Taltal shares marked 14s. Business up to 26½ was recorded in Chilean Northern 5 per cent debentures, but Mexican Central debentures eased to 78½. Antofagasta ordinary and preference stocks were 7½ and 39½d respectively. United of Havana second income stock was 43½ and the consolidated stock 6½. San Paulo units kept at 5s. 6d.

Canadian Pacific strengthened to \$44½, while the preference stock and 4 per cent debentures were £65½ and £88½ respectively. Among White Pass stocks, the convertible debentures were £90 and the loan stock £33½, but the no par value shares eased to \$25.

Midland of Western Australia was 22½ and Emu Bay debentures 20½, while among Indian stocks, Barsi have changed hands at 122. Nyasaland Railways 3½ per cent debentures were 81.

In road transport shares, Devon General transferred around 28s., Maidstone & District at 21s. and West Riding were 34s., Southdown were 31s., but Lancashire Transport eased to 46s. 6d. B.E.T. "A" 5s. deferred units have been less firm at 42s. 6d. though the market is continuing to assume the dividend is likely to be raised to at least 40 per cent.

Various improved financial results drew attention to shares of locomotive builders and engineers. Vulcan Foundry have advanced strongly to 28s. 3d. following the results and the raising of the dividend from 7 per cent to 9 per cent and the addition on a 2 per cent cash bonus as well this time. Gloucester Wagon 10s. shares were 17s. 4½d., and North British Locomotive rose further to 17s. 7½d. under the influence of the big improvement in profits. Wagon Repairs 5s. shares were 12s. 6d., Hurst Nelson 42s. and Birmingham Carriage 29s. 1½d. Elsewhere, Beyer Peacock advanced to 38s. 3d. Charles Roberts 5s. shares were 9s. 6d.

Big gains were shown in other engineering shares, sentiment having been influenced by the tax concession for industry in respect of new plant. Vickers were up to 60s. in advance to the dividend announcement. Babcock & Wilcox rose to 55s. 3d., Guest Keen to 58s. 7½d., T. W. Ward to 90s. 6d. and the increase in the dividend to 21 per cent put G. & J. Weir 5s. shares up to 20s. 3d., Ruston & Hornsby advanced to 49s. 6d.